

ENVIRONMENTAL ASSESSMENT BOARD



ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 24

DATE: Tuesday, June 4, 1991


BEFORE:

HON. MR. E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,
R.S.O. 1980, c. 140, as amended, and Regulations
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro
consisting of a program in respect of activities
associated with meeting future electricity
requirements in Ontario.

Held on the 5th Floor, 2200 -
Yonge Street, Toronto, Ontario,
on Tuesday, the 4th day of June,
1991, commencing at 10:00 a.m.

VOLUME 24

B E F O R E :

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DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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1 ---On commencing at 10:02 a.m.

2 THE REGISTRAR: This hearing is now in
3 session. Please be seated.

4 THE CHAIRMAN: Mr. Rogers.

5 MR. ROGERS: Thank you, sir.

6 RONALD TABOREK,
7 DAVID BARRIE,
8 JOHN KENNETH SNELSON,
9 JUDITH RYAN; Resumed

10 CROSS-EXAMINATION BY MR. ROGERS:

11 Q. Ladies and gentlemen, I will address
12 my questions to the panel. I don't mind which of you
13 answers them. Perhaps I will start first though with
14 you, Mr. Taborek, as we have met before.

15 The Ontario Hydro system has
16 traditionally been a winter peaking system.

17 MR. TABOREK: A. Yes.

18 Q. However, things are changing. You
19 are now developing a peak in the summertime?

20 A. Not strictly true. Some parts of our
21 system are summer peaking, the cities, some of the
22 southern cities. We are not near a summer peak on the
23 system as a whole. It is having the effect of
24 flattening our load curve, increasing our load factor.

25 Q. I understand.

A. Flattening our load curve.

1 Q. The system has traditionally been a
2 winter peaking system I suppose because it's a cold
3 country.

4 A. Yes.

5 Q. A lot of electricity is consumed in
6 the wintertime to keep people warm.

7 A. Yes.

8 Q. And the reason that we are now
9 starting to develop localized summer peaks is because
10 of the air conditioning load, I imagine.

11 A. That's one example, but it's usually
12 a myriad of effects of course, not one single one.

13 Q. Of course. But the incremental load
14 which seems to be driving this summer peak is the air
15 conditioning load; would you not agree?

16 A. Yes.

17 Q. And when Ontario Hydro produces
18 electricity during its peak, whether in the winter or
19 the summer, do you predominantly burn coal to do so?

20 A. There will be a mix. There is a
21 large amount of coal in the mix.

22 Q. Well, of course you use all your base
23 load plant whenever you can, but during peak periods do
24 you typically burn coal to meet the peak load?

25 A. Yes.

1 Q. And coal I suppose would be the most
2 environmentally damaging of your fuels?

3 A. I don't think you can say that. I
4 don't know that there is any evidence to that effect.
5 It certainly has environmental consequences as do all
6 other forms of generation. I think that may be in the
7 eye of the beholder.

8 Q. What do you think, sir, as someone
9 who has been at Ontario Hydro for a long time in a
10 senior engineering capacity, which of the fuels that
11 you presently burn do you think is most damaging to our
12 environment?

13 A. Of the fuels we burn, you narrow my
14 choice considerably. I think I would have to say coal.

15 Q. Thank you.

16 A. I would say hydraulic is the most
17 damaging to the environment.

18 Q. All right. Thank you.

19 So, hydraulic would be the most damaging
20 in your opinion, to the environment.

21 A. In my personal opinion.

22 Q. Of course you don't burn fuel when
23 you run water over a dam, but when you burn fuel in the
24 fossil plants you would think that coal would be the
25 most damaging of your fuels?

1 A. Well, I am going to now come back,
2 and I think the word "damaging" needs qualification
3 because all of our generating stations meet acceptable
4 limits. A good deal of time would have to be spent on
5 defining what is damage.

6 Q. Fair enough.

7 A. So, I would put all kind of caveats,
8 and I think maybe the best way to round that out is to
9 say that there would be a great deal of concern about
10 the coal.

11 Q. All right. I didn't mean to choose
12 such a provocative word.

13 In any event, we can agree that to the
14 extent that Ontario Hydro can avoid burning coal at the
15 peak, the environment is likely to benefit.

16 A. I would change that around. If coal
17 is burned, then controls have to be fitted to permit it
18 to operate within the appropriate regulations and
19 legislation.

20 Q. Controls like scrubbers and other
21 similar equipment?

22 A. That's correct.

23 Q. Very expensive to install, relative
24 terms.

25 A. Well, very expensive. They cost what

1 they cost.

2 Q. Natural gas can be used to produce
3 electricity?

4 A. Yes.

5 Q. It can be used in combustion turbine
6 unit?

7 A. Yes.

8 Q. Combustion turbine units are peaking
9 units?

10 A. Yes.

11 Q. Well suited to meet short demands at
12 the peak of your system?

13 A. The pure normal cycle CTU, yes.

14 Q. And to that extent it might be
15 possible to substitute gas burning CTUs for coal plants
16 at the peak?

17 A. Yes.

18 Q. Similarly, natural gas can be burned
19 in larger plants such as the Hearn plant here in
20 Toronto.

21 A. Yes.

22 Q. And, in fact, you did at one time
23 burn natural gas at Hearn, here in Toronto; did you
24 not?

25 A. Yes.

1 Q. In the 70s?

2 A. Yes.

3 Q. At moment, I understand, Ontario
4 Hydro does not burn any natural gas to produce
5 electricity in Ontario?

6 A. That's correct.

7 MR. SNELSON: A. Not quite correct. It
8 is used as ignition fuel at some stations.

9 Q. Yes, ignition fuel. That's why I
10 qualified it by saying to produce electricity per se.
11 Thank you, Mr. Snelson.

12 Q. Well, to the extent that you could
13 substitute the use of natural gas to produce
14 electricity at the peak for coal, would not the
15 environmental damage be less, or the environment
16 concern be less?

17 MR. TABOREK: A. Well, the sulphur
18 dioxide produced would be less.

19 Q. Thank you. Now, you have told us
20 that Ontario Hydro is beginning to develop local peaks
21 in the summertime, probably because of the increasing
22 air conditioning load.

23 Is it not true, sir, that the natural gas
24 transmission and distribution system tends to have
25 spare capacity in the summertime?

A. My knowledge of that is hearsay, I believe that to be the true.

Q. All right. And so it may well be possible for Ontario Hydro to take advantage of that spare capacity during the summertime to acquire natural gas to burn to meet the peak at this developing peak in the summertime?

A. Well, possibility -- I think you would have to qualify that. It would appear to be technically feasible to obtain the gas. Whether it was economically appropriate or otherwise appropriate, they are many for factors than those you are describing.

Q. Quite right, I agree with you. To the extent that there is spare capacity on the gas transmission system, there should be more economic gas available during the summer, that's obvious; isn't it?

...

1 [10:11 a.m.] A. Well, if we limit the definition to
2 the pure flow through of pipe, yes, but there are other
3 factors regarding that dictate availability than past
4 capacity of a pipe.

5 MR. SNELSON: A. Our experts on fossil
6 fuel supply appear on Panel 7, which is from our fuels
7 division. My understanding, in discussion with them,
8 of the situation on natural gas availability in the
9 summer, is that it's not clear. I don't want to tell a
10 natural gas person natural gas business, but it is not
11 clear to us that there is a large spare capacity in the
12 gas system in the summer.

13 We are told that the reduced demand for
14 natural gas in the summer permits the replenishing of
15 annual storages during the summertime and permits
16 maintenance on the gas pipeline.

17 So, I don't think the most authoritative
18 evidence that we can give on that subject is on that
19 opinion. In terms of natural gas supply, that is our
20 fossil fuel people.

21 Q. Fair enough.

22 A. I just wanted to qualify that.

23 Q. I suppose the best source for that
24 would be the gas industry itself?

25 A. I would think so.

1 Q. Now, we have agreed, then, that
2 natural gas technology does exist in the form of CTUs,
3 I'm sorry, combustion turbine units, CTUs, and in the
4 conventional fossil-type plants like Hearn, to produce
5 electricity.

6 MR. TABOREK: A. Yes.

7 Q. The lead times in constructing
8 natural gas facilities such as CTUs are relatively
9 short, that's also understood, isn't it?

10 A. Yes. Subject, of course, to having
11 approvals to do so.

12 Q. Of course, of course. And it's an
13 active fuel at least from the perspective of emissions?

14 A. It has advantages as well as
15 disadvantages.

16 Q. One of the important factors,
17 however, as you've pointed out, is the cost?

18 A. Yes.

19 Q. Costs are important in making the
20 choice of competing generation technologies?

21 A. Yes.

22 Q. Mr. Taborek, tell me, is it a good
23 thing for an electric system to have diversity of
24 generation supply?

25 A. There are some advantages to it. It

1 is not necessarily an absolute. There are many
2 provinces in Canada who have one hundred percent
3 hydraulic. There are many utilities in the U.S. who
4 are near enough to being one hundred percent coal.

5 Q. In the absence of the ability to be
6 one hundred percent hydraulic, is it not generally
7 thought to be advantageous to a utility to have diverse
8 sources of generation supply?

9 A. There are advantages to having
10 diversity and disadvantages.

11 Q. Well to the extent that --

12 A. You may diversify it, you may add
13 another link to you chain, which is the weak link. Not
14 to imply that gas would be that but, one has to be
15 careful with diversity.

16 Q. Quite right. But, if you could
17 develop different sources of electricity generation
18 which was reliable that would add to your reserve in a
19 sense because of the diversity?

20 A. Yes. To the reserve, well not to the
21 reserve, it would give you diversity.

22 Q. It would add to the reliability of
23 the system because it would give you some flexibility
24 in operating various forms of technology to meet load?

25 A. It would be a useful addition.

1 Q. All right. Fair enough.

2 So, it would be useful, all other things
3 being equal, to have natural gas on your system, from
4 that perspective?

5 A. Yes.

6 Q. Now, when you looked at the cost of
7 the facilities which you presently have in place and
8 when you analyzed it over the years to decide what kind
9 of capacity should be installed, I imagine you looked
10 at the capital cost of those facilities as one thing?

11 A. Yes.

12 Q. You would look at the fuel costs as
13 another important factor?

14 A. Yes.

15 Q. And, thirdly, you would look at the
16 OM&A costs, the operation, maintenance and
17 administrative expense associated with each?

18 A. Yes.

19 Q. Hydro does distinguish its OM&A costs
20 from its fuel costs, do you not?

21 A. Yes.

22 Q. Now, I distributed to you through
23 your counsel, earlier, some excerpts from the Ontario
24 Energy Board reports. Have you seen those Mr. Taborek?

25 A. Yes.

1 Q. In fact, you testify at the Ontario
2 Energy Board frequently, do you not? In Ontario
3 Hydro's rate cases.

4 A. Yes, I testify with respect to
5 depreciation.

6 Q. Yes and I am not going to get you in
7 much beyond that. This will be a very simple
8 discussion. But, just so that this Board can
9 understand, the scheme in Ontario is that when Ontario
10 Hydro wishes to raise it's rates, it must submit itself
11 to a public hearing before the Ontario Energy Board?

12 A. Yes.

13 Q. This has happened annually for the
14 past, I think, probably, 16-17 years?

15 A. I believe the present hearing which
16 is starting within a few days is HR 20. So, it would
17 be the twentieth.

18 Q. All right. Thank you.

19 Now, Mr. Chairman and Members of the
20 Board, I have given to the court clerk, excerpts from
21 Ontario Energy Board decisions, which I would like to
22 refer to very briefly this morning. I have provided
23 copies to my friend, I have even, lastnight, underlined
24 the relevant parts for you. I hope you can follow this
25 more easily.

1 Could that be given an exhibit number,
2 sir.

3 THE CHAIRMAN: Could we give it a
4 collective exhibit number, please.

5 MR. ROGERS: Yes, it's all attached as
6 one.

7 THE CHAIRMAN: Number?

8 THE REGISTRAR: 165, Mr. Chairman.

9 ---EXHIBIT NO. 165: Excerpts from last three rate
10 cases before the OEB.

11 MR. ROGERS: Now, if I could explain, Mr.
12 Chairman, how this document is put together. It's
13 excerpts from the last three rate cases before the
14 Ontario Energy Board. And, for the Board's convenience
15 I realized last night that these had been put together
16 without consecutive page numbers. I numbered them
17 myself so, you will see at the top righthand corner
18 that it is paginated and I have inserted yellow tabs
19 for you to delineate between the three years.

20 So, we start at the beginning, I have
21 written on HR 19, the first page, following that are
22 some excerpts from the Boards report on HR 19 which was
23 a hearing held in 1990 for the 1991 rates which are now
24 in existence. If you go down to the first yellow tab,
25 you will see I have written HR 18, which is that

1 Board's designation for the hearing held in 1989 for
2 the 1990 rates.

3 And the last tab is HR 17 which was a
4 hearing held in 1988. I'd like to just ask the
5 witnesses about a few of the excerpts here. I'm
6 dealing, now, with the operation, maintenance and
7 administrative expense, which Mr. Taborek and I agreed
8 would be an important cost consideration in the
9 selection of the type of machine to produce
10 electricity.

11 Are you with me, ladies and gentlemen?

12 MR. TABOREK: Does HR 17 start on page
13 15?

14 MR. ROGERS: Well it should be page 14.

15 MR. TABOREK: 14. Oh, yes.

16 MR. ROGERS: Q. Now, Mr. Taborek or any
17 of your colleagues can answer it. It has been, I
18 think, fair to say that Ontario Hydro's operation,
19 maintenance and administrative costs have been rising
20 over the past few years?

21 MR. TABOREK: A. Yes, Mr. Rogers, I
22 testified to that in my direct.

23 Q. Yes, I believe you did.

24 And Ontario Hydro has made the case
25 before the Ontario Energy Board that because of the way

1 the system needs to be operated it's important that you
2 devote more OM&A dollars to running the system than
3 traditionally has been the case, in order to get the
4 maximum output from the existing machines. Correct?

5 A. Essentially, but I think perhaps it
6 should be rephrased to state that the performance of
7 some of the existing units has deteriorated and
8 programs are required to restore the performance of
9 those units. That requires both capitol and OM&A. And
10 we have put that in place.

11 Q. Thank you. Could you turn please to
12 the second yellow tab, which is the beginning of the
13 excerpt on HR 17 and is the Board's report from its
14 1988 hearing.

15 The excerpt started page 14, you'll see
16 under Recommendation 17, there, that the Ontario Energy
17 Board, after the hearing, Mr. Taborek recommended a
18 \$30-million overall decrease in the proposed OM&A
19 budget proposed by Ontario Hydro.

20 A. Yes. That is what is said there, I'm
21 not knowledgeable of that myself.

22 Q. Fair enough, I don't ask you to
23 comment on whether that was a reasonable conclusion or
24 not. The fact is, and I wanted this brought to this
25 Board's attention, that the Ontario Energy Board, a

1 board charged with the responsibility of reviewing
2 these costs has expressed a serious concern about the
3 increase in Hydro's OM&A costs.

4 That is fair, is it not?

5 A. I'm not sure that I am the expert.
6 What I know is what is here before me and my general
7 knowledge but this has not been my area of expertise at
8 the OEB, and depending on how much detail you want --

9 Q. Very little. That is what the Board
10 appears to be saying in its report.

11 A. Now, I believe the general context of
12 this is with respect to CRESAP, in general efficiency.

13 THE CHAIRMAN: In respect to what, I'm
14 sorry?

15 MR. TABOREK: CRESAP is an exercise in
16 which management consultants were engaged to review the
17 overall efficiency and the staffing of the company.
18 They made a number of recommendations which were
19 implemented and I'm reading Recommendation 17 in the
20 context of CRESAP. You will notice it references it.

21 MR. ROGERS: Yes. The history here, sir,
22 is that the corporation retained consultants to do a
23 study of the corporation and advise it where
24 efficiencies could be improved and where costs could be
25 reduced?

1 MR. TABOREK: Reduced, yes.

2 MR. ROGERS: I think it is fair to say
3 that one of the things that the CRESAP study
4 recommended is that Ontario Hydro reduce some of its
5 manpower, in certain areas?

6 MR. TABOREK: Yes.

7 MR. ROGERS: Q. If we turn the page to
8 page 15, Mr. Taborek, you'll see in paragraph 7.1 of
9 the Board's report in the second part of that first
10 paragraph, the Board says,

11 "In 1988 they - meaning OM&A costs -
12 increased by 20 per cent in nominal terms
13 over 1987 and in 1987 by 8 per cent over
14 1986. Accepting Hydro's calculation of
15 the general inflation rate over this
16 period as the relevant OM&A inflation
17 rate this is an average real increase of
18 over 9 per cent for the 3 years."

19

20

21

22

23

24

25

...

[10:25 a.m.] MR. TABOREK: A. That is what it says.

Q. So that your OM&A costs over that period were rising more rapidly than inflation?

A. Yes.

Q. Now, let's move forward a year, if we could, and if you turn to the tab ahead of that one, at page 7, you will see the beginning of the excerpts from HR 18, which was the hearing held in 1989. You will see the first line there says that:

"OM&A costs are forecast to be \$1.7-billion in 1990, an increase of 350-million (26 per cent) over the two year period 1988 to 1990."

A. That is what it says.

Q. So, it would appear that the OM&A component of Ontario Hydro cost increased by 26 per cent over that two-year period.

A. Yes.

Q. And if we turn as well, please, to page 12 of that same document, page 107 from the Board's report but page 12 from this document, you will see under the heading "Summary" that the Ontario Hydro Board concluded:

"OM&A costs continued to rise well above inflation and Hydro is apparently

1 unable to significantly affect this
2 trend. The Board is concerned about this
3 OM&A cost increase of \$350-million
4 between 1988 and 1990. It lacks any
5 meaningful benchmarks against which to
6 judge this increase. Nevertheless, a
7 simple comparison indicates that it
8 represents a 26 per cent increase,
9 whereas the load growth is only increased
10 by 5 per cent and inflation by about 10
11 per cent."

12 So, that was the Board's conclusion,
13 right or wrong, that's what they said.

14 A. That is what it says, yes.

15 Q. Now, if Ontario Hydro Board was right
16 after its analysis, that would mean your OM&A costs
17 were rising substantially faster than load growth.

18 A. Yes.

19 Q. Which is a reflection, I guess, of
20 reducing the efficiency of the existing system, Mr.
21 Taborek?

22 A. What do you mean, a reflection of
23 the --

24 Q. Well, it's taking more money, more
25 manpower, more programs to try to keep the system

1 producing as much power as it can, to put it simply.

2 A. Well, I think I would like to make a
3 distinction between the OM&A required to maintain the
4 existing generating units on the existing system and
5 other OM&A. I have no expertise to speak to the total
6 OM&A of the corporation.

7 What I have testified, though, and we
8 have introduced figures in evidence to illustrate this,
9 that if you look at all of our generation, the
10 hydraulic, the fossil and the nuclear, we have
11 essentially come out of a period of relatively good
12 performance in, generally speaking, the early 80s, and
13 in the latter part of the 1980s there is indication of
14 a deterioration in the capability of the units, and
15 that that would naturally call for efforts to restore
16 the capability of those units because that is clearly
17 the economic thing to do.

18 And so that increases in rehabilitations,
19 et cetera, in a particular period of time, would quite
20 naturally result in indices on the basis of per
21 kilowatthour, per load growth, per whatever being
22 different. But nevertheless, one should view a change
23 in a few years as what it is, namely a change in a few
24 years.

25 Q. It's like a car, a car is getting

1 older, you have to spend more and more money to keep it
2 on the road.

3 A. No. To develop your car analogy,
4 since the fossil and nuclear stations have 40 years
5 lives and the hydraulic stations have indefinite lives,
6 let's use 40 years, we are roughly at the half life,
7 and so if you have a car life of five years and we are
8 at two-and-a-half years, I don't think you would apply
9 that logic to the half-life maintenance that you do.

10 I think what you may wonder about is if
11 you have a spurt of maintenance at half life, if you
12 perhaps have been giving it sufficient attention before
13 that.

14 Q. The car analogy is not entirely apt,
15 but it's a question of an aging system requiring more
16 and more money to keep it running smoothly; isn't it?

17 A. No, I would accept your statement if
18 it were in the 35 to 40 year age range for the
19 stations. I couldn't accept it at the 20-year range.

20 Q. So, this is happening prematurely in
21 your view?

22 A. No, no. I think I have divorced what
23 is happening now from the aging comments you made.

24 Q. So, we could expect then for these
25 OM&A costs to rise even more dramatically in the future

1 as the system ages more?

2 A. I think that's an extrapolation of
3 what I have said that I wouldn't agree to. We will
4 find out in the future what these costs will be like.

5 Q. Don't you think it's likely that it
6 will cost more to run the system as it gets older and
7 older?

8 A. No, not generally. And let me
9 explain.

10 There is, in general, when you look at
11 wear curves for any product, frequently there is a
12 teething area, there is then a steady state period and
13 then there may or may not be a wear-out period.

14 In the case of generating stations, they
15 are frequently amenable to removal and replacement of
16 components. And in the case of the hydraulic, which I
17 think is a good example, a large number of stations,
18 components being removed and replaced as time goes on,
19 you would not expect that phenomenon. You would not
20 expect a wear-out for the system as a whole, because
21 each individual component as it wears would be taken
22 out and replaced, and whether there would be a bunching
23 sort of depends on the particular lives of the
24 components.

25 Now again, there are elements of that in

1 the fossil and nuclear. So, I think it I am concerned
2 your statement is just too general.

3 Q. Thank you. I really meant to exclude
4 hydraulic because you are going to run hydraulic.

5 A. Yes.

6 Q. But on the fossil side, isn't it
7 likely that the fossil plants, the coal plants, the oil
8 plant, and the nuclear plants, as they age will demand
9 more and more OM&A dollars to keep them running?

10 A. Well, I think again, near the end of
11 life, yes. In the period up to and approaching end of
12 life, not necessarily.

13 Q. But perhaps.

14 A. I'm sorry, that's just too general a
15 proposition to respond to.

16 Q. I must talk to you about what kind of
17 car you drive. Let's move on anyway.

18 One of the things that affects your
19 requirement for OM&A dollars, I suppose, among other
20 things, would be environmental regulations?

21 A. Yes.

22 Q. And I think you testified here, and
23 elsewhere, that Ontario Hydro is under increasingly
24 stringent environmental controls?

25 A. Yes.

1 Q. You mentioned a moment ago that
2 Ontario Hydro has a program to install scrubbers on
3 your coal plants.

4 A. Yes.

5 Q. In order to meet the emission
6 standards of the province.

7 A. Yes.

8 Q. As I understand it, Lambton is
9 currently being converted?

10 A. Two scrubbers are on order for
11 Lambton for in-service in 1994.

12 Q. And how about Nanticoke?

13 A. Our plans also have -- well, maybe
14 just to go step by step.

15 The next step we would make when a
16 further level of control is required would be to fit
17 the remaining two scrubbers at Lambton, so all four
18 units would be fit, and then we would go to Nanticoke
19 and we would go progressively through the Nanticoke
20 unit as and when required.

21 Q. Thank you, sir.

22 Now, Lambton, can you just give me a
23 timetable, roughly when you expect the scrubbers to be
24 in place at Lambton?

25 A. Approximately a year or two -- no,

1 not a year. Two years after the first pair, so say
2 approximately '96, if my memory serves my right.

3 Q. And then you would look at Nanticoke
4 which is another major coal-fired plant on your
5 system--

6 A. Yes.

7 Q. --and start to install scrubbers
8 there, presumably.

9 A. That's correct. These are decisions
10 that we review annually in the light of the latest
11 forecasts and requirements, having earlier obtained a
12 blanket EA approval to fit scrubbers as needed.

13 Q. Yes, I saw that in answer to Mr.
14 Shepherd's question, and you advised the Board that
15 Hydro has received blanket environmental approval to
16 put on about 20 scrubbers?

17 A. Up to 20 scrubbers.

18 Q. Up to 20 scrubbers. Who installs
19 these scrubbers. Do you contractors, outside of
20 contractors who actually do a lot of the work?

21 A. I believe so. The details, again I
22 would refer to you the fossil panel.

23 Q. Perhaps I will follow it up in more
24 detail with them.

25 A. That is the general.

1 Q. All right. And so Hydro would have
2 to have presumably go out, get bids from contractors
3 and pay the price, depending on the demand for those
4 contractors' services at the time?

5 A. Yes.

6 Q. Are you familiar with the Clean Air
7 Act in United States, Mr. Taborek, in general terms?

8 A. Generally, yes.

9 Q. I understand it the Clean Air Act is
10 a --

11 A. The Clean Air Act or the Clean Air
12 Act amendments that have recently been implemented?

13 Q. Whatever it was that requires the
14 installation of scrubbers on U.S. coal plants.

15 A. Actually, both.

16 Q. All right, thank you. So, let's take
17 them together.

18 As I understand it, the U.S. scheme is
19 that there is a requirement now for U.S. coal plants to
20 begin installing scrubbers themselves; is that your
21 understanding?

22 A. Well, the original Clean Air Act
23 which was passed in the early 70s, did impose
24 requirements for scrubbers. The Clean Air Act
25 amendments have, in effect, made the regulations or the

1 limits stricter, and they will require additional
2 action by utilities, and they do have flexibility but
3 some will undoubtedly go for scrubbers, some will go
4 for low sulphur coal, some will go for gas, depending
5 on what is economic for them.

6 Q. Ms. Ryan, you look anxious over
7 there. You could perhaps add to this discussion.

8 Do you know what time limits there are on
9 the U.S. utilities to meet these standards in the U.S?

10 MS. RYAN: A. The first step down, I
11 believe, is in 1995 and the second step down in the
12 year 2000.

13 Q. Thank you very much.

14 A. And again, it is left up to the
15 utility as to how they will meet their emission level.

16 Q. Am I correct that in United States
17 there are very much coal burning electricity producing
18 plants?

19 MR. TABOREK: A. Yes?

20 Q. Hundreds?

21 A. More than hundreds.

22 Q. Many hundreds?

23 A. Yes.

24 Q. So, potentially there are many
25 hundreds of coal plants in United States which will be

1 considering the addition of scrubbers within the next
2 five to ten years; true?

3 A. Yes.

4 Q. And there will then be increasing
5 command for the contractors available to install
6 scrubbers in North America over the next five to ten
7 years?

8 A. Yes.

9 Q. That will have the inevitable effect
10 of increasing the cost.

11 A. There will be two effects. If there
12 should be a scarcity, which is the direction you are
13 implying, that would tend to increase costs. If you
14 increase the production of something and you gain
15 experience with that thing, that would tend to decrease
16 cost.

17 Q. All right, fair enough.

18 A. It depends very much on the
19 proportion of the utilities that go for scrubbers as
20 opposed to gas and low sulphur coal.

21 Q. One of the things they may do is
22 convert to natural gas?

23 A. Yes.

24 Q. And as you pointed out, there are
25 competing factors. But to the extent that the demand

1 increases, that, taken alone, will tend to increase the
2 cost of the contractors who do the planning and
3 installation of scrubbers, that taken alone.

4 A. Taken alone in large quantities, I
5 think it depends on the surplus that the particular
6 person has. Increases in orders up to his production
7 capability will reduce costs; beyond that, it will
8 increase it, in general economic parlance.

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1 [10:40 a.m.] Q. I think there will be other
2 witnesses who will be better able to answer these types
3 of questions but, do you know whether Ontario Hydro has
4 analyzed potential increases in the cost of installing
5 scrubbers at your Lambton and Nanticoke plants in view
6 of the Clean Air Regulation in the U.S. and the likely
7 increase in demand for the contractors who do the
8 installations.

9 A. Yes. As I say, we do analysis every
10 year with respect to a scrubber decision when we do
11 that analysis we look at a range of alternatives, and
12 in the case of scrubber decision we would look at low
13 sulfur coal as alternative and natural gas as an
14 alternative. And, yes, we keep close watch on the U.S.
15 situation and, yes, we look at the sensitivity of the
16 decision to changes in capital cost and, indeed, all
17 other key factors.

18 Q. All right. Thank you, Mr. Taborek.
19 Thank you, ladies and gentlemen. Thank you Mr.
20 Chairman. Those are my questions.

21 THE CHAIRMAN: Mr. Poch, Mr. Starkman.

22 MRS. FORMUSA: Could I just correct the
23 reference made to Panel 7 with respect to the witness
24 speaking to fuels it is Panel 8. Mr. Snelson mentioned
25 7, but it is Mr. Smith, on Panel 8.

1 THE CHAIRMAN: Thank you.

2 MR. STARKMAN: David Argue is with me
3 this morning, he's the case manager with the
4 Environmental Coalition. We've previously distributed,
5 I guess, two documents of which there are copies up
6 here at the front, if people need them. One I'd like
7 to have marked as an exhibit, Mr. Chairman, that's the
8 one that, I guess, leaves a space for an exhibit
9 number, it's called "Related Materials for use in CEG
10 Cross-Examination."

11 THE CHAIRMAN: No. 166.

12 ---EXHIBIT NO. 166: "Related Materials for use in CEG
13 Cross-Examination."

14 MR. STARKMAN: Thank you. I guess we've
15 also distributed a memorandum dated May 30th, 1991
16 which endeavoured to indicate the other materials that
17 we would be referring to.

18 THE CHAIRMAN: I see you have got a
19 number of transcripts on your table, are you planning
20 extensively refer to transcripts?

21 MR. STARKMAN: I am going to refer, I
22 wouldn't say extensively, but there are a few
23 references that I will be making.

24 THE CHAIRMAN: Will you be reading the
25 refences in?

1 MR. STARKMAN: I will read the references
2 in.

3 THE CHAIRMAN: So, we probably won't need
4 to turn them up. All right.

5 MR. STARKMAN: The other matter which we
6 have filed or indicated we intended to refer to was is
7 Exhibit 2.7.85. I just want to be sure everyone has
8 that. Excuse me, Interrogatory 2.7.85. Which was, I
9 hope, stapled to the May 30, 1991 memorandum. And just
10 this morning we distributed copies of Exhibit 2.14.38
11 which was referred to by Ms. Ryan yesterday and which
12 we wanted to make reference to.

13 For the benefit, I guess, of the witness
14 panel and the hearing panel, I would just like to
15 indicate that we have been here through the last weeks
16 and have heard the questions and really don't intend to
17 repeat the questions or to go, hopefully, into areas
18 which have already been covered.

19 We have really three areas that we wanted
20 to question on. The first is what we perceive as the
21 lack of information and initiative concerning the
22 environmental of the existing system and the
23 processes in place at Hydro for including environmental
24 concerns in planning for the future of the existing
25 system.

1 The second is we're concerned that the
2 issue of planning reserve margin entirely judgmental
3 and is really of very limited use for planning
4 purposes.

5 The third area is that we're concerned
6 that Hydro does not fully utilize the alternatives
7 available to it for better use of the existing system.

8 Those are the three areas I think we
9 would like to question on. And perhaps, if I could
10 just start with our first area of concern which is lack
11 of information and initiatives concerning the
12 environmental performance of the existing system.

13 CROSS-EXAMINATION BY MR. STARKMAN:

14 Q. I guess these first questions are for
15 you Ms. Ryan. I am just wondering if you could turn
16 up, from Hydro's filing, Exhibit 136. These are the
17 overheads that were used in the initial presentation.
18 I'm looking here at page 12 of those filings which was
19 a chart, I guess, the "1990 Environmental Management
20 Structure, Ontario Hydro" chart.

21 Ms. Ryan, you told us that you are senior
22 environmental advisor in the environmental division at
23 Ontario Hydro. Can you just confirm for me where the
24 environmental division is, on this chart?

25 MS. RYAN: A. Environment division is

1 entitled, environment in corporate planning branch.

2 Q. It's not named as a division there
3 like the law division or the audit division?

4 A. No, to simplify the chart we left off
5 the words department and division but environment under
6 corporate planning is, in fact, environment division.

7 Q. All right. In the reporting
8 arrangements, you would report to whom, in corporate
9 planning?

10 A. I report to the Director of the
11 Environment and she reports to the Vice-President of
12 Corporate Planning.

13 Q. Now, you told us in Interrogatory
14 2.14.38, that in the environment division there is a
15 director for senior environmental advisors, one
16 communications coordinator, one environmental advisor
17 and three support staff?

18 A. That's correct.

19 Q. Those are the people who carry out
20 the responsibilities which you've listed on the second
21 page of the interrogatory?

22 A. That's correct.

23 Q. Ms. Ryan, what would the budget be of
24 the environmental division? Approximately?

25 A. I would think it's about

1 one-and-half-million dollars.

2 Q. What does that consist of?

3 A. That consists of salaries and work
4 that consultants would do for us.

5 Q. You say on the second page here, I'm
6 looking at the primary delivery function
7 responsibilities. That is the second page of
8 Interrogatory 2.14.38. One of the things, the primary
9 delivery function in the environmental division is to
10 assess the risk related to environmental issues?

11 A. Yes.

12 Q. What does that mean, to assess the
13 risk?

14 A. That means to look at the
15 implications of our operations on the environment. I
16 think one of the important points is that we do not
17 necessarily do the work ourselves if we have
18 responsibility for it, we are to make sure that there
19 is work in the corporation being done in that area.

20 Q. But you are responsible, one of your
21 primary functions is to assess the risk?

22 A. That is one of our primary functions,
23 yes.

24 Q. How do you go about assessing the
25 risk. First of all, what risk are we talking about?

1 Can we just pin that down a little bit?

2 A. This is certainly one of the areas
3 where we have more work to do. I will agree with you
4 there.

5 The types of risk that we have looked at
6 in the past are along the lines of the types of
7 analyses that are included in the environmental
8 analysis which was part of the Demand/Supply Plan. So,
9 it has not been costed in dollar values.

10 It has been looked at in terms of amounts
11 of emissions, compliance with the regulations,
12 monitoring before and after the installation of a new
13 facility to see if the assumptions that were made about
14 the design and construction and operation were, in
15 fact, correct, so that action can be taken if they
16 weren't. For those areas where there are other
17 specific concerns, to make sure that there are studies
18 being carried out to better define the concern and the
19 work required to mitigate it.

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1 [10:50 a.m.] Q. Ms. Ryan, what I am unclear on, you
2 say, assess the risk is an area which requires more
3 work. You don't dollar cost out the risk. I assume
4 the risk we are talking about here is risk to the
5 environment.

6 A. Yes, I'm sorry. It is risk to the
7 environment.

8 Q. You have defined the environment for
9 us, and in that respect, let me just read back to you
10 what you said--

11 A. Okay.

12 Q. --in your examination in chief, which
13 is Volume 16, page 2743, so I can be sure we are
14 starting at the same place, the answer was:

15 "Environment, as we defined it,
16 includes the natural system of air,
17 water, land, plants, animals, including
18 human beings and their interaction,
19 social, cultural and economic interaction
20 with the system. So really, it includes
21 both the natural environment and the
22 social environment."

23 A. Yes, that's what I said.

24 Q. So, when you say assess the risk
25 related to environmental issues, what you are

1 supposedly doing is assessing the risk that's related
2 to the environment broadly defined?

3 A. That's correct.

4 Q. But you say you don't do that by
5 quantifying it in dollars terms. What you do is you
6 look at the amount of emissions, compliance with
7 regulations, and what does that tell you, you look at
8 it and what does it tell you when you look at it?

9 A. I said we also do other things but on
10 the point you mentioned, the regulations which have
11 been set, environmental regulations were, in fact, set
12 to protect the environment which includes all of the
13 things I have mentioned.

14 So, as a first cut at assessing risk, you
15 look at emissions and whether or not you are meeting
16 the regulation and that gives you some confidence that
17 you are, in fact, protecting the environment.

18 The next step is that you go out into the
19 environment and measure and I have mentioned that we
20 do, in fact, do that. We monitor around our nuclear
21 stations and we monitor around our fossil stations, and
22 other things.

23 So, then you are looking at whether the
24 linkage between your emissions and what it looks like
25 in the broader environment is true, and then you do

1 more detailed studies to cover new facilities.

2 Q. Ms. Ryan, is it your position, or
3 Hydro's position that if they meet an existing
4 regulation, then there is no environmental damage?

5 A. It is Hydro's position that, as a
6 minimum, we should meet the law, and I think we
7 recognize that there are areas that need study and
8 perhaps more limited emissions would help the
9 environment. And, in fact, we are looking at those
10 areas in consultation with other stakeholders and
11 government for a number of areas which have been
12 mentioned, such as NOx emissions for groundlevel ozone
13 and carbon dioxide emissions for global warming.

14 MR. TABOREK: A. Usually, the existing
15 laws are a reflection of society's judgment that the
16 benefits of the further reduction and the costs of the
17 further reduction are about balanced, and that is
18 essentially what we look at as well, the balance of the
19 benefits and the costs.

20 Q. Yes, I think you told us that several
21 times over the past few days, Mr. Taborek. I mean, I
22 am looking at Volume 21, page 3675, and this is talking
23 about the purchases from United States, you say:

24 "So, the environment was not harmed,

25 we met the law, we met our environmental

1 obligations. While we were meeting our
2 obligations to provide reliable
3 electricity at least cost, we did so
4 meeting problems with the nuclear units
5 than we had forecast and planned for, and
6 we did so while providing, I believe, for
7 a 60 per cent growth in the use of
8 electricity over this same period."

9 A. Yes.

10 Q. That's the same point you are making
11 again?

12 A. Yes.

13 Q. There is a balance here, but that
14 Hydro takes the view that if they meet the law, then
15 that is sufficient from an environmental point of view,

16 A. No. We must meet the law.

17 Q. Yes?

18 A. And I think we have indicated that we
19 recognize it is desirable to improve on that if at all
20 possible. But there are a set of balances that must be
21 made among the various objectives that the public
22 wishes to us meet.

23 Q. And what those, roughly speaking,
24 three objectives were, we are expected to produce
25 reliable electricity, we are expected to produce low

1 cost electricity, and we are expected to produce
2 electricity in the manner acceptable to the people of
3 the province. So, there are three broad factors that
4 must be kept in balance.

5 Q. Exactly. And my question to Ms. Ryan
6 was, does the environmental division cost out the risks
7 to the environment? Do they provide a cost which can
8 be input into the equation that you are putting
9 forward, and I guess your answer is no.

10 MS. RYAN: A. In dollar value, no.

11 Q. That's what you said yesterday to Mr.
12 Grenville-Wood, that the environmental division doesn't
13 cost it out. Is there any other division or area of
14 Ontario Hydro which provides a dollar value cost to the
15 externalities, if I could put it that way, or of the
16 existing system?

17 A. The one area where we have, in fact,
18 costed emissions is for the National Energy Board in
19 our applications for a licence to export. We cost the
20 incremental emissions projected for export, and that
21 has been done, and it has been filed with the National
22 Energy Board.

23 Q. Yes. And what division or area,
24 within Hydro, does that analysis?

25 A. It's a joint study. Since I have

1 mentioned that environmental responsibly is across the
2 corporation, to do that sort of task is a task force
3 but operations has the lead responsibility because it's
4 their application, their licence.

5 Q. So, I am just looking back at this
6 chart on page 12 of Exhibit 136, you say operations.
7 Who, in operations, performs that responsibility or
8 performed the responsibility of preparing that costing
9 for the National Energy Board application?

10 MR. BARRIE: A. We, in operations. Do
11 you want me to point it out on the chart?

12 Q. I see it there.

13 A. It's under operations, under
14 production.

15 MS. RYAN: A. I think the point you are
16 missing with this chart is that this does not give all
17 line managers in Ontario Hydro, because they have
18 environmental responsibilities, they all do, they are
19 not on here. What is on here are those specialty
20 groups which provide them assistance. So, Mr. Barrie's
21 group does not appear here as a specific group.

22 Q. Do the environmental division
23 participate in the preparations of the filings with the
24 National Energy Board?

25 A. The preparation was initiated before

1 environment division existed. So, at the tail-end we
2 were aware of them being done, yes.

3 Q. Did you participate in the
4 development of it? Did you comment on it?

5 A. I personally did not. They were
6 prepared by consultants.

7 Q. Did the environment division comment
8 on it?

9 A. I'm sorry, I don't know specifically.

10 Q. Have you had an opportunity to look
11 at that part of the National Energy Board filings?

12 A. I have reviewed the summary.

13 Q. From an enviromental point of view
14 are you satisfied with that type of methodology and the
15 answer?

16 A. I believe the methodology used for
17 the task at hand was the best that they had, yes.

18 Q. So you are satisfied?

19 A. I am not an economist, I am not a
20 modeller, so I am basing it on what the experts in
21 those areas have said, yes.

22 Q. Now, that type of analysis, as we
23 know, wasn't filed as part of the DSP application with
24 this Board.

25 A. No, because the analysis was for

1 export only and it was not felt that it could be
2 extrapolated for this purpose.

3 Q. Yes, I understand that. But what I
4 am talking about is the costing of these externalities
5 wasn't filed as part of--

6 A. That's correct.

7 Q. --the DSP. Do you have any idea why
8 that type of costing was not filed as part of this
9 application?

10 MR. SNELSON: A. We have considerable
11 concerns as to the ability to reliably estimate the
12 costs of externalities in dollar terms. We feel that
13 the most reliable and useful treatment of external
14 effects beyond those that are captured in our costs is
15 through separate consideration on the basis of their
16 own merits as separate physical factors to be
17 considered, and that's the way they are considered in
18 the DSP.

19 We are intending to have discussion on
20 this particular point in Panel 3. This is part of our
21 discussion of costing concepts in Panel 3. You will
22 see it's referred to in the Chapter 6 of the
23 Demand/Supply Plan.

24 Q. Ms. Ryan, could I refer you to
25 Appendix A of Exhibit 21, which I believe is the 1989

1 State of the Environment Report. It's page 93.

2 THE CHAIRMAN: 93, did you say, Mr.
3 Starkman?

4 MR. STARKMAN: Yes, page 93.

5 Q. And this appendix is entitled "Toward
6 an Energy Efficient Ontario, Ontario Hydro Corporate
7 Strategy for the 90s"?

8 MS. RYAN: A. Yes.

9 Q. I am looking down here at the bottom,
10 the part that begins "Goal".

11 "Given that the province's long-term
12 economic prosperity depends upon the
13 ability to minimize ecological costs,
14 Ontario Hydro will develop and manage its
15 activities and facilities in such a way
16 as to sustain the environmental base."

17 Then it has Strategic Thrusts, the last
18 one being, "ensure that environmental impacts and
19 associated costs to mitigate them are fully accounted
20 for in planning."

21 A. Yes.

22 Q. Now, I take it the environmental
23 division was, in part, responsible for the preparation
24 of this report?

25 A. Had the coordinating role of putting

1 it together, yes.

2 Q. Are you satisfied that the DSP
3 ensures that environmental impacts and associated costs
4 are fully accounted for in the planning?

5 MR. SNELSON: A. I don't believe you
6 have read the full quote, Mr. Starkman, in your last
7 question.

8 The DSP includes the costs to mitigate
9 environmental effects. So, to the extent that there
10 are mitigations that are required or desirable, they
11 will result in costs to Ontario Hydro and they are
12 accounted for in the DSP.

13 Q. Well, my question was really for Ms.
14 Ryan, and let me try to put it perhaps a little
15 differently.

16 My reading of this appendix seems to
17 indicate that Ontario Hydro's corporate strategy is to
18 ensure that environmental impacts and associated costs
19 to mitigate them are full accounted for in planning.

20 MS. RYAN: A. Yes.

21 Q. Now, Ontario Hydro has put forward a
22 plan for approval, and I am asking you whether you are
23 satisfied that it ensures that the environmental
24 impacts and associated costs are fully accounted for in
25 the DSP document?

1 A. I don't think it's fair to take the
2 DSP document without looking at what this hearing
3 process is going to provide as the final outcome. I
4 think that the plan has the ability to do that, yes.
5 That there is flexibility built into it, depending on
6 which option is implemented.

7 But, I think it's premature to go to that
8 step without seeing the outcome of these hearings which
9 are, in fact, to bring forward the environmental
10 concerns of Ontario and have those built into the plan.

11 Q. Well, hopefully, that will be the end
12 result, but what I am asking you is whether that DSP,
13 in the plan whether it fully accounts for these
14 environmental costs, whether you are satisfied that the
15 document itself, the Demand/Supply Plan and supporting
16 documentation filed by Hydro in support of the Plan
17 take into account the environmental cost associated
18 with its plan?

19 A. Could you specifiiy exactly what you
20 mean by environmental cost?

21 Q. Well, we started off with the
22 definition of environment, and that's what I am talking
23 about. You defined it, I read it back to you, you
24 agreed with it. It includes a natural system of air,
25 water, land, plants, animals and so forth.

1 A. I know environment. I meant cost.

2 Q. How would you define the cost?

3 A. I would prefer your definition.

4 THE CHAIRMAN: No, Mr. Starkman is here
5 to ask the questions and you are here to answer them,
6 so you can't ask him questions.

7 MS. RYAN: Okay.

8 THE CHAIRMAN: He has asked what you
9 consider associated costs to mitigate mean, and if you
10 can answer that you should, if you can't, then don't.

11 MS. RYAN: As I pointed out, we don't
12 have it in dollar costs. However, we have the
13 indication of impact based on the assessments done.

14 MR. STARKMAN: Q. I don't understand.
15 You say you have the indication of impact based on the
16 assessments done. I don't understand that.

17 MS. RYAN: A. The analysis that was done
18 was based upon the assessment of emissions and resource
19 use and socio-economic implications, so that the
20 various options could be assessed against the same
21 criteria.

22 Q. I am just trying to find the page.
23 In the environmental analysis, that is what you are
24 referring to, where you have done that?

25 A. Yes.

1 Q. Where you say things like, in Plan 15
2 you will have more emissions or less emissions than in
3 Plan 24.

4 A. That's correct.

5 Q. But that doesn't tell us anything
6 about the -- it tells us perhaps relative to the
7 various options, but it doesn't tell us anything about
8 the costs associated with any particular plan.

9 A. If you are talking about cost as a
10 dollar cost for externalities, you are correct, we do
11 not have any bottom line dollar figure.

12 Q. And so, is it your position or
13 Hydro's position that the weighing should just take
14 place as to whether one or another of the proposed
15 plans has more or less emissions, more or less impact
16 as you have outlined it in the environmental analysis?

17 I just noticed, it seems to be starting
18 at page 5-24 and going on. I am just looking here at
19 5-24, 5.2.3, which is Case 15, which I take it is
20 Hydro's preferred plan, and it's this analysis that you
21 are talking about.

22 A. I was talking about the method of
23 analysis, but for the preferred plan, yes, that's it.

24 Q. But the method of analysis is the
25 comparison as between plans as to which one of the

1 proposed or discussed plans has a greater or lesser
2 impact on the various sections you have identified?

3 A. Yes.

4 Q. And do you tell us anything, in the
5 DSP, about the externalities of the various plans in
6 non-dollar terms. You said you didn't do it in dollar
7 terms, but you do you attempt to do any quantifications
8 in areas that are non-monetary?

9 A. That is what the environmental
10 analysis has attempted to do, yes.

11 Q. Is there any effort to quantify the
12 effect on the natural environment, let's say, from any
13 of Hydro's proposed plans?

14 A. As I mentioned, it quantified it in
15 terms emissions to air, emissions to water, resource
16 use and socio-economic implications.

17 Q. Let's turn to some of that and see
18 how the quantification worked. I would like to go to
19 perhaps some of the material in Exhibit 136. I guess
20 we could start with....

21 If we go can back to look at the existing
22 system. On page 14 of Exhibit 136, that's where you
23 talk about the acid gas emissions.

24
25 ...

1 [11:12 a.m.] A. I'm sorry, what was the page number?

2 Q. Page 14 of Exhibit 136, which is
3 Hydro's filing.

4 A. Yes.

5 Q. I must say that the impression I got
6 from listening to the evidence is that Hydro doesn't do
7 anything in the environmental area unless they are
8 required to do so by regulation, do I have that
9 correct?

10 A. I don't agree with that
11 interpretation, no.

12 Q. The sulphur dioxide, nitric oxide
13 emission standard came in, I take it, in the early 80s?

14 A. The first year of regulation was '87,
15 yes.

16 Q. What was Hydro doing about these
17 emissions prior to '87?

18 A. They were lowering the sulphur in the
19 coal.

20 Q. Do they ever a standard they were
21 working to internally?

22 A. Not to my knowledge.

23 Q. What does this chart on Exhibit 14
24 tell us about the environmental impact of these
25 emissions?

1 A. It tells us that we are meeting the
2 law and our knowledge of the law is that it was set
3 taking into account the environmental impact.

4 Q. That may or may not be so, and I
5 guess we'll hear from the government with respect to
6 that. But, what I'm asking you is, what does this
7 presentation tell us about the impact on the natural
8 environment or on the environment of the emission
9 numbers that you've shown?

10 A. I think you have to go to our ambient
11 sulphur dioxide monitoring data to look at what the
12 levels are in the environment and the fact that the air
13 quality levels have been improving in Ontario and
14 specifically around our stations.

15 I think you have to go to the acid
16 deposition monitoring stations in Muskokas and other
17 sensitive areas in the province to see what the result
18 of us reducing emissions is on the environment. These
19 data don't give that, you are correct.

20 Q. You don't get any of that from this
21 chart, am I correct?

22 A. No, this chart was not designed to
23 show the impact on the environment.

24 Q. This doesn't tell us anything about
25 the impact on the environment. It just tells us that

1 Hydro's acid gas emissions are reducing, in that, they
2 are meeting the regulation?

3 A. Given that the regulation takes into
4 account impact on the environment, it tells you that.

5 Q. If you turn to page 18 of Exhibit
6 136, you told us this is the annual radiation dose,
7 average Ontario resident. Again, I'd ask the same
8 question. It tells us about the dose but what does it
9 tell us about the impact on the environment?

10 A. So, you're not including humans in
11 the environment?

12 Q. I am including humans in the
13 environment.

14 A. I think the underlying assumption is
15 that the regulation was developed taking into account
16 scientific information to protect the environment and
17 so that what it is intended to tell you.

18 Q. Yes, but is it Hydro's position that
19 the regulation that there is - with respect to
20 radiation - a safe level, there's a threshold level
21 below which there is no risk?

22 A. I believe if you want to get into the
23 risk of very low levels of radiation the people on
24 Panel 9 are better equipped to deal with that. Our
25 position is that in limiting our emissions and the

1 implicit dose to the public that there should be no
2 appreciable risk.

3 Q. I understand that. Ms. Ryan, I
4 notice in your curriculum vitae which was filed by
5 Hydro that 1986 to '89 you were the Technical
6 Superintendent, Environmental Protection Section Radio
7 Activity Management in Environmental Protection; is
8 that correct?

9 A. That's correct.

10 Q. I want to come back to the question,
11 is it Hydro's view that the regulation specified by the
12 AECEB is a threshold below which there is no risk? You
13 understand the question?

14 A. I understand the question,
15 responsibility for public dose is part of health and
16 safety division which has nothing to do with the
17 position I was in and those are the people that could
18 better answer that question.

19 I don't think we would ever say zero
20 risk. It's a very, very small risk.

21 Q. But the risk increases with the dose?

22 A. I'm not in a position to --

23 Q. Ms. Ryan, you put forward this and
24 spoke to this page.

25 THE CHAIRMAN: All this page does is show

1 what the annual radiation dose of the average Ontario
2 resident is. That is all it's meant to do and that's
3 all it's designed to do.

4 MR. STARKMAN: Mr. Chairman, I think it's
5 designed to show you that the station boundary is small
6 compared to the natural radiation in other bargraph
7 lines which are a lot larger. The question I'm asking
8 is, what does the station boundary bargraph tell us
9 about increased mortality and morbidity?

10 THE CHAIRMAN: Nothing, I would suggest.
11 It tells you that it's slightly about equal to an
12 airline flight and slightly larger than consumer
13 products and a great deal smaller than medical exposure
14 and natural radiation, that's all it tells you.

15 MR. STARKMAN: It tells us nothing about
16 the increased health effects as a result of this
17 increase dose?

18 THE CHAIRMAN: No, it doesn't purport to
19 do that.

20 MR. STARKMAN: I couldn't get a straight
21 answer on that.

22 Q. Now, again, I guess the same answer
23 would apply with respect to the graphs concerning the
24 cubic meters of solid radioactive waste which is page
25 19 of Exhibit 136. You've told us about how much solid

1 radioactive waste there is, but what does it tell us
2 about the impact of that on the environment, I guess
3 the answer is nothing.

4 MS. RYAN: A. The answer is that it's
5 being stored in appropriately designed storage areas so
6 that the regulatory requirements are, in fact, being
7 met.

8 Q. It tells us nothing about the
9 toxicity of it?

10 A. That graph? You are correct.

11 Q. Have you told us anything about the
12 toxicity of this solid radioactive waste in the DSP?

13 A. I don't know that specifically, but
14 again that is an area that Panel 9 would address.

15 Q. I notice that you didn't provide us
16 with any information with respect to particulate or
17 heavy metal emissions. Was there some reason for that?

18 A. There is some of that information in
19 the State of the Environment Report and we did answer
20 an interrogatory on trace emissions from our station.

21 Specifically, Interrogatory 2.14.70
22 provided the information from Lakeview stack testing.

23 Q. Has Hydro been meeting the
24 regulations with respect to particulates and heavy
25 metals?

1 A. With respect to heavy metals, based
2 on the testing we've done, yes.

3 For particulate, as I pointed out in my
4 direct evidence, we do have opacity emission problems
5 which we are improving. Particulate emissions from the
6 stack, to my knowledge, meet the regulations.

7 Particulate emission as fugitive dust
8 from coal and ash piles sometimes, depending on weather
9 conditions, we have problems.

10 Q. Now, yesterday, Mr. Taborek told us
11 that it was the company policy, or will be the company
12 policy, to run fossil units with scrubbers in
13 preference to fossil units without scrubbers.

14 Were you aware of that policy?

15 A. I was aware that there had been
16 discussion on it. I wasn't aware specifically that it
17 was now a policy.

18 Q. Is it written down somewhere, this
19 policy. Mr. Taborek.

20 MR. TABOREK: A. Yes.

21 Q. Could you provide us with a copy of
22 that.

23 A. Yes.

24 Q. I don't know what number that is.

25 MRS. FORMUSA: 142.62. We haven't given

1 one this morning, I don't beleive.

2 THE CHAIRMAN: No, I don't think so.

3 MRS. FORMUSA: Then this is 142.62.

4 ---UNDERTAKING NO. 142.62: Ontario Hydro undertakes to
5 provide a copy of the company policy
6 which states it is preferential to run
7 fossil units with scrubbers over fossil
8 units without scrubbers.

9 MR. STARKMAN: Mr. Taborek, maybe I
10 should just follow up with you since you seem to be
11 aware of the policy.

12 Am I correct that when you run units with
13 scrubbers - I am talking fossil units here - that it
14 increases the particulate and ash emissions, and also
15 the carbon emissions?

16 On a per unit basis?

17 MR. TABOREK: A. First of all, take them
18 in order, particulate, ash--

19 Q. And carbon?

20

21

22

23

24

25

...

1 [11:25 a.m.] A. --and carbon. Well, no to
2 particulate. There is a limit to be met and it will be
3 met.

4 Ash, to the extent that the scrubber
5 requires some additional energy to operate on itself,
6 typically one per cent of the station output, then more
7 coal would be burned.

8 And what do you mean by carbon? And
9 there would be no change in carbon.

10 Q. I am talking carbon dioxide.

11 A. In carbon dioxide then there will be.

12 THE CHAIRMAN: Did you say no change?

13 MR. TABOREK: No, in carbon, there is
14 some carbon left in coal ash, and if you change your
15 combustion characteristics you can get different
16 amounts of carbon in ash.

17 In this case, he is referring to carbon
18 dioxide, and because we would have to use about one per
19 cent of the energy to produce the energy to run the
20 scrubber, then there would be a one per cent increase
21 in carbon dioxide.

22 MR. SNELSON: There is a small additional
23 amount of carbon dioxide because the reagent that is
24 used is limestone, which is calcium carbonate, and the
25 reaction that catches the sulphur releases some carbon

1 dioxide from the limestone. So, there is a small
2 additional amount from that cause, too.

3 MR. STARKMAN: Q. Just so I am clear,
4 the answer was no increase in the release of heavy
5 metals?

6 MR. TABOREK: A. No. No on
7 particulates. Yes on ash and carbon dioxide.

8 Q. In terms of the trade-offs that are
9 involved with this type of decision, that is to run
10 with the scrubbers and the various increases, who makes
11 those trade-offs? Who does that weighing?

12 A. In the particular incidents of the
13 least emission dispatch of scrubbers, it was a decision
14 made by Hydro in consultation with the Minister of
15 Environment. In the early days of developing the acid
16 gas control program, the ministry was interested in the
17 application in Canada of the least emissions dispatched
18 type of situation for Hydro, because that is done in
19 the U.S.

20 It was in the course of that that we
21 worked through our position or this policy statement on
22 the preferential dispatch of scrubbed units, and we
23 advised the Ministry of that.

24 Q. I guess my question was, where in
25 Hydro or who within Hydro or what area within Hydro

1 makes that decision?

2 A. It would ultimately be the board of
3 directors, of course. In this particular example, as
4 the coordinator of the acid gas control program, I
5 coordinated activity among a number of responsible and
6 interested units, and I took that decision through our
7 hierarchy. I believe, if my memory serves me right,
8 the actual letter was signed by the chairman.

9 Q. And how do you do the weighing? This
10 is back the to the same question I was asking about,
11 the weighing, considering the risks, the environmental
12 risks. How do you weigh those risks when you make this
13 type of decision?

14 A. With analysis and judgment.

15 Q. Is there anything you could direct us
16 to that help us out as to the analysis you used to make
17 that decision?

18 A. Yes. We looked at various least
19 emission dispatch proposals, came to a conclusion as to
20 what an appropriate least emissions dispatch meant to
21 us, identified the key decisions that had to be made
22 and then we had them made.

23 MR. STARKMAN: Mr. Chairman, this might
24 be an appropriate time for the morning break.

25 THE CHAIRMAN: Break for fifteen minutes.

1 THE REGISTRAR: This hearing will recess
2 for fifteen minutes.

3 ---Recess at 11:30 a.m.

4 ---On resuming at 11:50 a.m.

5 MR. STARKMAN: Q. Ms. Ryan, I know you
6 had a discussion with Mr. Shepherd the other day about
7 the Atomic Energy Control Board licensing criteria and
8 the concept of ALARA, as low as reasonably achievable,
9 and I am unclear as to the outcome of that discussion.
10 By that I mean, is Hydro aware that this is part of the
11 Atomic Energy Control Board regulations; that is, to
12 reduce emissions to a level that is as low as
13 reasonably achievable?

14 MS. RYAN: A. Yes.

15 Q. So, the one per cent fits into your
16 testimony and examination in chief as to Hydro's
17 emissions being one per cent of the AECB, fits in with
18 the concept of reducing them as low as reasonably
19 achievable?

20 A. At the time the one per cent target
21 was set, which again was in the early 1970s, I believe
22 it would fall into the category, yes.

23 Q. Now, I also believe that previously
24 there was a brief discussion about mining, and I
25 thought that the answer was that Hydro wasn't

1 responsible for emissions, health and safety or
2 otherwise, with respect to mining activities in Elliot
3 Lake?

4 A. Perhaps you could refresh my memory
5 on the discussion.

6 Q. Perhaps I will just start it again.
7 Does the environmental division, or anyone else at
8 Ontario Hydro, have any responsibility for mining
9 activities in Elliot Lake?

10 A. I would assume that that would be
11 primarily the responsibility of the mining company.

12 THE CHAIRMAN: That's not an exact
13 response.

14 The question was, does Hydro assume or
15 take any interest or responsibility?

16 That is what you want.

17 MR. STARKMAN: Yes, that was the
18 question.

19 MS. RYAN: I don't have any specific
20 information with respect to Elliot Lake. I know
21 that -- well, I will leave it there.

22 MR. SNELSON: My understanding is that
23 the mining companies are regulated by the Atomic Energy
24 Control Board and other regulatory bodies, and that
25 Ontario Hydro's contracts to purchase uranium include a

1 requirement that they should meet all regulatory
2 limits.

3 And further than that, the details of how
4 the uranium mining business is handled from Ontario
5 Hydro's point of view, I would expect to be dealt with
6 in Panel 9.

7 MR. STARKMAN: Q. That is fine. Mr.
8 Snelson, I guess you are not aware as to whether the
9 contracts between Hydro and Rio Algom or Denison
10 contain clauses with respect to health and safety, or
11 operating costs and so forth. You are not aware of
12 whether those types of provisions with written into the
13 contracts?

14 MR. SNELSON: A. Apart from the general
15 understanding that they are required to meet regulatory
16 requirements, I am not aware of that.

17 The details of uranium contracts would be
18 more appropriate for Panel 9.

19 Q. Ms. Ryan, am I correct that Hydro at
20 the present time doesn't have any plan for the disposal
21 of high level radioactive waste?

22 MS. RYAN: A. At this point in time our
23 radioactive waste -- you specified radioactive waste.
24 At this point in time, we are storing our radioactive
25 waste. But, for the low level waste there are plans

1 underway to look for disposal methods.

2 We do not define our used fuel as waste
3 at this point in time.

4 Q. You don't find this waste, what do
5 you define that as?

6 A. Nuclear used fuel.

7 Q. Nuclear used fuel. Let me rephrase
8 the question. Does Ontario Hydro at the present time
9 have any plan for the disposal of nuclear used fuel?

10 A. As I pointed out before, Panel 9 is
11 best able to address the detail of this. We are
12 currently storing our used nuclear fuel and are looking
13 at the options available for disposal in the future.
14 But, of course, we don't do that alone; we do that in
15 conjunction with government and with the Atomic Energy
16 Control Board.

17 Q. But, do I take it then the answer is
18 no, Ontario Hydro does not, at the present time, have a
19 plan for the disposal of this fuel?

20 A. To the extent that the disposal
21 process and site has not yet been defined and agreed
22 to, that's correct.

23 Q. I take it from what you are saying, I
24 know you are looking for a site, I know you are looking
25 for a method of disposal, but is the answer, at the

1 present time you have no plan for disposing of it? You
2 would like to dispose of it, but you have no plan for
3 effecting its disposal?

4 A. At this point in time there is no
5 approved plan for disposal, that's correct.

6 Q. With respect to the decommissioning
7 of nuclear facilities, does Hydro, at the present time,
8 have a plan for the decommissioning of these
9 facilities?

10 A. I believe that plans for the
11 decommissioning of our nuclear facilities have been
12 filed with the Atomic Energy Control Board, but for the
13 specific details of that you would have to ask Panel 9.

14 Q. So, you believe that Hydro has a plan
15 for the decommissioning of nuclear facilities?

16 A. That was a requirement by the AECB of
17 our nuclear facilities.

18 Q. Mr. Barrie, I had several questions I
19 wanted to ask you about. I reviewed your evidence in
20 chief and there were some graphic illustrations with
21 respect to the question, generally, of reserve margin.
22 One was you described the problem with the tornado in
23 1985.

24 MR. BARRIE: A. Yes.

25 Q. It's my understanding that that was a

1 transmission problem; am I correct in that?

2 A. That's correct. It initiated several
3 transmission problems, which reflected into the
4 generation.

5 Q. Yes. But no amount of reserve
6 margin, whether it's 20, 50 or 100 per cent, would have
7 assisted with respect to that problem because it was a
8 transmission problem.

9 A. I think if we had had extra
10 generation not affected, that is, away from the Bruce
11 site, then it would have been of some assistance, yes.
12 But I agree with you, it was essentially a transmission
13 problem.

14 Q. And you also described for us a
15 problem, I believe, the weekend of October 6 to 8,
16 1990.

17 A. Yes, I did.

18 Q. A problem which developed over the
19 course of the weekend.

20 A. That was a longer term development of
21 a problem, yes.

22 Q. And my recollection of that problem
23 was that the severity of it really set in when the
24 large nuclear unit went down.

25 A. I think that was the final straw that

1 broke the camel's back, if you will. There was a
2 sequence of events that occurred and that was the final
3 one.

4 Q. But generally, if you had had a
5 larger number of smaller generating units, you may not
6 have had this problem.

7 A. A large number of smaller units would
8 likely have resulted in a lesser impacts, clearly of
9 lesser impact to us if we lose a 200 megawatt unit than
10 if we lose and 850 megawatt unit, yes.

11 Q. Now, I just wanted to ask you for
12 clarification because I keep gettiang it confused in my
13 mind. The 24 per cent is a planning reserve margin,
14 that's what we are talking about.

15 A. Correct.

16 Q. There is also an operating reserve
17 margin?

18 A. That's correct.

19 Q. I noticed in, I think it is Exhibit
20 24, which is, I guess, entitled "The Independent
21 Consultant Review of Hydro Expectations and Targets for
22 Demand Management Activities," at page 10 and 11, in
23 there there is a list of a number of utilities, a
24 considerable number of utilities, and on page 11, Hydro
25 is there. It says: "Operating reserve margin, 31 per

1 cent." Do you see where I am here?

2 A. Yes, I have it.

3 Q. I really wanted to ask you what that
4 represented?

5 A. I have never seen this before. I am
6 not sure what is referenced here. If I could just take
7 a moment?

8 Q. Yes.

9 MR. SNELSON: A. If you look at page 13
10 of the same exhibit, then there is a definition.

11 MR. BARRIE: A. So, this represents the
12 operating reserve and what that means is what is
13 actually available. I think I am trying to distinguish
14 between operating reserve and planning reserve. I took
15 that to be the thrust of your question.

16 Q. Yes.

17 A. With operating reserve, we are
18 dealing with the actual situation as it is now. So, we
19 are looking at actual available generating plant,
20 compared to the actual demand to be met, the percentage
21 that you have over the actual demand is our operating
22 reserve.

23 So, there are a number of uncertainties
24 involved in planning that we don't have to take account
25 of. That is, if generation is delayed, in-service

1 dates, that kind of thing, that doesn't affect
2 operating reserve because we are dealing with the
3 actual situation.

4 DR. CONNELL: Excuse me, what would be
5 the timing of the peak cited, the 22.9 gigawatts, would
6 that be 1988 or...

7 MR. SNELSON: At the top of page 10,
8 there is a heading to this, this chart seems to be
9 carried over from page 10 to page 11, and the heading
10 seems to be 1988 peak demand in megawatts.

11 MR. STARKMAN: Q. Mr. Barrie, this is a
12 request for clarification. This says, I take it, that
13 this is just an indication that Hydro had what, an
14 average of 31 per cent operating reserve in 1988?

15 MR. BARRIE: A. I assume it's over the
16 peak. We normally express it at system peak.

17 MR. SNELSON: A. That may include
18 mothballed plant, I'm not sure.

19 Q. That was my next question.

20 My next question was, perhaps before I
21 get to that question. Is that number consistent with
22 what has happened at Hydro, say, during the 80s in
23 terms of operating reserve? Would you be able to tell
24 us?

25 MR. BARRIE: A. I think the best answer

1 to that is to reference you back to your 166.

2 Q. Yes, I was just going there myself.

3 I am looking here at page 20-21, it might be helpful,
4 of Exhibit 166, which are graphs essentially taken out
5 of Exhibit 6, the plan analysis. Is that where you are
6 looking as well?

7 A. Yes.

8 THE CHAIRMAN: What page was this?

9 MR. STARKMAN: Page 20 and 21 of Exhibit
10 166, which is the material that we filed.

11 Q. The question that comes to my mind
12 is, if planning reserve margin and operating reserve
13 are different, these are graphs showing historic
14 reserve margin?

15 MR. TABOREK: A. These are the actuals
16 in the year.

17 Q. These are the actual historic reserve
18 margin levels in a given year?

19 A. Just to draw a distinction, the
20 planning reserve margin is a target and the operating
21 reserve margin, there is an element of a target to it;
22 namely, it's what you try to meet.

23 Now then, as you actually enter into the
24 year, all kinds of things happen and you may or may not
25 have achieved your target. This is what the actuals

1 are.

2 And so, if you look at the history, this
3 starts from 1946 to '86 plus, you will note -- I would
4 estimate, I don't know exactly but I would estimate
5 that when we were a hydraulic system, our target, I
6 would presume, was in the range of 10 per cent. And
7 what you can see is that our actuals were above and
8 below this target. And towards the latter part of this
9 period, our target was 24 per cent say, in the mid-20s,
10 and again you see the actuals were above and below this
11 target.

12 Q. Mr. Taborek, what I am trying to get
13 at, let me go back again.

14 Mr. Barrie, would you know what the
15 operating reserve was, say, through the 80s?

16 MR. BARRIE: A. Well, historically we
17 can go back and analyze the 80s. I can't tell you
18 year-by-year what the operating reserve was.

19 This is a much better characterization of
20 the actual operating reserve.

21 Q. I will come back to this question
22 about the operating reserve. But what is troubling me
23 is, this says historic reserve margin levels. Now, are
24 you saying to me that this -- the reserve margin I
25 thought was for planning purpose, now you are saying

1 that this is really what the operating reserve was as
2 well. Did the two concepts meld somehow, after the
3 year has passed.

4 A. Perhaps I should clarify operating
5 reserve again, from my direct evidence.

6 Operating reserve is the reserve that we
7 actually have available at any given instant. And the
8 NPCC have a criteria, the Northeast Power Coordinating
9 Council, have criteria that require us to have a
10 certain amount of operating reserve on at all times.
11 So, at this instant in time now we have a certain
12 operating reserve.

13 Q. That is a 10 minute, 30 minute
14 reserve?

15 A. Ten minute and 30 minutes. So it's
16 round-about, right now I expect we would have around
17 1400 megawatts of operating reserve at this instant.
18 That is different from what we are talking here.

19 THE CHAIRMAN: Here being the graphs?

20 MR. BARRIE: On the graph, beg your
21 pardon. These graphs are a historical review of the
22 reserve that we had.

23
24
25 ...

1 [12:06 p.m.] One key difference, for instance, if we
2 have a lot generators available on a lightly-loaded
3 day, we'll not synchronize some generators. So, they
4 won't be operating reserve of in terms of that instant
5 in time. So, operating reserve is about what we
6 actually have synchronized right now.

7 MR. STARKMAN: Q. These graphs, on Page
8 20 and 21 of Exhibit 160, show you what the operating
9 reserve was?

10 MR. BARRIE: A. No, they show you what
11 the reserve was.

12 Q. Whether it was synchronized or not?

13 A. Exactly. So, you take a year when
14 there is 40 percent reserve margin, we would not be
15 synchronizing all of that generation, we would leave a
16 lot of generation idle.

17 MR. SNELSON: A. On any given day some
18 of it will not be available.

19 THE CHAIRMAN: Looking at figure 3-10 or,
20 even better, looking on Page 20, how would you go about
21 plotting that graph, what data would you use to plot
22 historical reserve margin?

23 MR. SNELSON: My understanding is that it
24 is the total installed capacity less mothballed plant.

25 THE CHAIRMAN: Less?

1 MR. SNELSON: Less any mothballed plant.
2 Any plant that was not actually available in that year
3 because, for instance it doesn't have staff there, it
4 has been put into a state of preservation because it's
5 not expected to be used. In our case, at the moment,
6 the mothball plant is the Hearn Generating Station the
7 Keith Generating Station and one unit at Thunder Bay.

8 THE CHAIRMAN: It would be total
9 installed capacity minus something wouldn't it?

10 MR. SNELSON: Minus multiple capacity.
11 Minus the peak load for the year and this is quoted as
12 December's. Is it December reserve load. So, it would
13 be divided by the peak load for the year.

14 MS. PATTERSON: So, it doesn't have to be
15 in-service, it's capacity?

16 MR. SNELSON: It is total capacity that
17 is been declared commercially in-service but in our
18 terminology the mothballed plant is in-service even
19 though it's not available in that particular year. But
20 it doesn't account for any plant, on any given day,
21 that is not available because of a short-term problem.
22 Forced outage.

23 MS. PATTERSON: So, it's not operating
24 reserve for that reason?

25 MR. SNELSON: It is not operating reserve

1 for that reason. It doesn't account for any plant that
2 we choose not to run on that date and it is not
3 synchronized, as Mr. Barrie has said.

4 THE CHAIRMAN: Wouldn't then the
5 operating margin always be less than this reserve
6 margin.

7 MR. BARRIE: Yes.

8 MR. STARKMAN: Q. I just want to be
9 clear you don't include mothballed plants in the
10 operating reserve; is that correct?

11 MR. SNELSON: A. In the definition of
12 reserve that is on Page 20 of figure 3-12, mothballed
13 plant has been excluded, as it is shown, from the
14 heading.

15 Q. And when you refer to the three
16 mothballed plan the units that's mothballed at Thunder
17 Bay is that the Atikokan unit?

18 A. No.

19 Q. Is there a unit mothballed at
20 Atikokan?

21 A. There is a unit mothballed at Thunder
22 Bay and it is Unit 1 and it has a capacity of a little
23 bit less than one hundred megawatts.

24 Q. Now, I guess the last question which
25 is where I started, Mr. Barrie the 31 per cent that we

1 start off looking at, can you help us out at all as to
2 where that came from or what it means?

3 MR. BARRIE: A. I think it really
4 relates to the kind of calculation Mr. Snelson just
5 described that resulted in these graphs here. So, the
6 31 per cent would represent the installed capacity as
7 of 1988, less the peak demand divided by the peak
8 demand. There would be no inclusion of mothballed
9 plants. But, it would include everything that is
10 in-service, by that I don't mean actually synchronized,
11 not being used. As a distinction, available to be
12 in-service perhaps would be a better way to describe
13 it.

14 MR. SNELSON: A. This table was prepared
15 by consultants for Ontario Hydro as a survey of many
16 utilities. This was just an incidental piece of
17 information which I think they collected as a general
18 indicator of whether any of these systems are close to
19 there reliability margin or not. It is not a principal
20 part of this report to collect operating reserve margin
21 data for utilities.

22 Q. Mr. Snelson, I guess I'd like to move
23 on to talk about the relationship between generation
24 and transmission. Would you agree with me that in
25 planning a system, it's necessary to take into account

1 the availability of transmission.

2 A. In a general sense, yes. But, I
3 don't know what specifics you are referring to.

4 Q. I thought the other day you told the
5 Board that this would be a generation planning hearing.
6 That you weren't looking at the related transmission?

7 A. I believe our position in this area
8 is that this is primarily about generation and
9 alternatives to generation, including demand
10 management, non-utility generation and purchases. That
11 the consideration of transmission is to the extent that
12 it is necessary to do a good job in analyzing
13 generation.

14 So, transmission is considered to the
15 extent that it effects the operation of generation or
16 to the extent that the costs, for instance, of
17 transmission might influence the generation options
18 that are chosen. So, it is a secondary consideration
19 but it is not excluded.

20 Q. But you haven't really looked at
21 optimizing the existing generation in transmission
22 systems?

23 A. That is what our system planning
24 division is attempting to do, all the time.

25 Q. So you have looked at it?

1 A. The whole planning process that we go
2 through seeks to arrive at the best total system,
3 including generation and transmission.

4 Q. Well, Mr. Taborek, I thought you told
5 us the other day that there were a number of models
6 that attempt to do this. This, meaning the
7 optimization of generation and transmission, but that
8 Hydro really hadn't really looked at the problem
9 because the models were in their infancy and couldn't
10 capture all of the parameters?

11 MR. TABOREK: A. No. In particular, I
12 don't believe I used the words "we hadn't looked at the
13 problem," because the problem is really the focus of
14 all of our business activities. And yes, we have
15 looked extensively at models. We have, indeed,
16 pioneered in some of the developments of them and we
17 have some models.

18 What we essentially said, is that the
19 generation decisions can be made without a simultaneous
20 optimization of generation and transmission.

21 And, if I may, I've described that in
22 various testimony, sort of the analytical approach and
23 the judgmental approach. I would like to refer you to
24 Exhibit 140.

25 Q. That's the 1981 Reliability Criteria?

1 A. Which is the 1981 Reliability Report
2 and in particular, Table 2-5. Excuse me, not Table 2-5
3 figure 2-5.

4 This figure I think gives an additional
5 insight, aside from what I have given to date, of the
6 two different types of decisions that are being made in
7 selecting the generation and transmission. You'll
8 notice what the figure shows is plotted against
9 generation reserve margin. You see the economic cost
10 of distribution unreliability, the economic cost of
11 transmissionreliability and the on top of that, the
12 economic cost of generation reliability.

13 We have used figurative language like
14 generation reliability as a cliff and we're trying to
15 stay away from getting too close, so that these swings
16 that I referred to just a minute ago, about the
17 different plans don't push you over the cliff.

18 What you're trying to do with your
19 generation reserve decision is trying to avoid getting
20 too close to the region where you have a high risk of
21 incurring those large general outage costs. If you
22 just think about it that problem remains regardless of
23 how big or how small those transmission and
24 distribution components are. You are really focussing
25 so that you could remove those two bottom slices and

1 you have the same generation decision.

2 Or, you could make them a thousand times
3 as big as they are and you still have the same
4 generation decision, which is, how close should you be
5 to that, in this case, upside-down cliff. So, that's
6 why we say that the generation margin decision, simply
7 speaking, can be made independent of the transmission
8 question.

9 The remaining question is how to insure
10 that they are in balance and I have addressed that in
11 other parts of my testimony.

12 Q. Mr. Taborek,that is a very,
13 seemingly, theoretical way to look at it. But, isn't
14 it, and I think you have told us this, that most of the
15 interruptions on the system are as a result of
16 transmission and distribution?

17 A. Well, first of all, this is not a
18 theoretical way, this is, I thought, a simple graphic
19 and visual way. Earlier in my testimony I mentioned
20 that the question that you are addressing in attempting
21 to achieve a balance between generation and
22 transmission is not the number of system-minutes of
23 interruptions, but what you're looking at is the amount
24 by which those reductions can be reduced per dollar
25 invested on the generation side so you are looking at

1 the derivative compare to the transmission side
2 compared to your customer damage costs.

3 What these elaborate models attempt to do
4 is to try and encompass that. In the absence of models
5 people are continually making judgments on those very
6 factors.

7 Q. I was going to come to the numbers
8 later but maybe we can just look -- if you are look at
9 that graph you are referring to, you have a cost in
10 there for the total economic cost of distribution
11 unreliability, that's the bottom and the next one is
12 total economic cost of transmission unreliability.

13 Where did you get that data from?

14 A. This was data at the time the
15 analysis was done in 1981.

16 Q. Yes, but where would it have come
17 from?

18 A. From corporate statistics at the
19 time.

20 Q. But, I guess, the point I'm trying to
21 make is, if you ask a customer whether it's corporate,
22 residential or whoever what their costs are -- there
23 may be some problems there, but they wouldn't be able
24 to distinguish between the transmission, a distribution
25 or generation interruption. They are just telling you

1 what the cost of the interruption is to them?

2 A. Correct. But we have information on
3 the cause of the interruption, in some instances.

4 Q. What I'm trying to get at is, you
5 have quantified the numbers here?

6 A. Yes.

7 Q. Just so I am clear what you're saying
8 is, you have information as to the cause of the
9 interruption but the customer wouldn't know what the
10 cause of interruption was?

11 A. Correct.

12 Q. How did you assign a dollar value to
13 it?

14 A. I didn't do this analysis, I don't
15 have that information, but people would have used, I
16 believe, the same customer damage cost applied to the
17 unsupplied energy that was attributable to this
18 particular item.

19 Q. Can we look at Exhibit 166 which is
20 material we filed on page 22.

21 A. Yes.

22 Q. This is an excerpt from Exhibit six,
23 the plan analysis. We were just talking about the
24 interruptions and so forth?

25 A. Yes.

1 Q. This I take it shows us the number of
2 generation related events between 1984 and 1988 which
3 resulted in interruptions?

4 A. Yes.

5 Q. I take it there was one in 1985?

6 A. Just one minute I think Mr. Barrie
7 has as testified to this, he may have some updated
8 numbers.

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1 [12:25 p.m.] MR. BARRIE: A. I'm sorry, what number
2 were you inquiring about?

3 Q. I was just confirming that this chart
4 showed that there was one generation related event
5 between '84 and '88 which resulted in a system
6 interruption. I am just looking straight at the chart.

7 A. You are looking under public appeals,
8 1985, Generation Related Events; is that it?

9 Q. Yes.

10 A. Yes.

11 Q. There were none that resulted in
12 voltage reductions?

13 A. That's correct.

14 Q. So, whatever disruptions there were
15 during those years, were related to transmission or
16 distribution; is that a fair assumption?

17 A. For these years you are looking at,
18 yes. I think I have, in my testimony, indicated 1989
19 was somewhat different.

20 Q. Yes, you indicated 1989 was a problem
21 year. We will come to that.

22 A. Yes. But for the years you are
23 looking at, that's correct, your analysis.

24 Q. We don't have the numbers for the
25 years prior to '84, but is it reasonable to assume that

1 there would have been few, if any, generation related
2 interruptions in those years as well?

3 A. If my memory is correct, I believe
4 that we had zero between '81 and '84, I believe that is
5 correct.

6 MR. SNELSON: A. This was a period of
7 very large generation surplus.

8 Q. Yes. And so, if you go back to
9 figure 2.5, which is what you were talking, Mr.
10 Taborek, how do you get that number, cost of direct
11 losses due to generation unreliability?

12 I am looking at the back of page 140,
13 when between '81 and '88 you only had one generation
14 related interruption?

15 MR. TABOREK: A. This was a calculation
16 done, first of all, in 1981, and secondly, what this is
17 is an expected value calculation. What an expected
18 value calculation is, is, in effect, a weighting of
19 experience over time at these particular reserve
20 margins, if you are at these reserve margins.

21 We have testified earlier that the nature
22 of these events on generation is that there will be
23 substantial periods, long periods of zero, and then you
24 will get one or two or three bad years, and the
25 expected value, the probabilistic weighting of these

1 over time, then gives an expectation, an average
2 result.

3 Q. That's why I said it was theoretical.

4 A. No, no, it's not theoretical.

5 Q. Let me finish the question.

6 A. I'm sorry.

7 Q. This was done in '81 with certain
8 predictions, through the '80s, anyway, it hasn't
9 happened because you haven't had generation related
10 outages.

11 A. Well, if you will, that is it
12 exactly, and we predicted correctly. Now, there were
13 some other factors, but if you turn to Table 5.2 in the
14 same report, Exhibit 140, the basic purpose of this
15 table and the text that describes it, is to point out
16 what people might expect in average years and in these
17 so-called bad years which are, in essence, the one in
18 ten that the calculation was done for here.

19 And if you look at that table what you
20 will see is that in the average year there are very few
21 problems. That your problems, as I have said, tend to
22 come in the bad years that hit you. I used that rather
23 macabre analysis of Russian Roulette, your problems
24 tend to be concentrated.

25 Q. I will come back to this table. I

1 just want to turn to the transmission/generation
2 discussion, and the problems that, at least, I see in
3 planning the generation without taking into account the
4 transmission and I guess what comes to mind is the
5 Bruce development. Isn't that a situation where the
6 generation went in first, to be followed by the
7 transmission?

8 MR. SNELSON: A. That was not the plan.
9 That was what happened.

10 Q. Yes. And that because of that
11 situation, and the way the transmission followed
12 without getting into the details, isn't that one of the
13 reasons that you had bottling at Bruce as you have
14 described?

15 MR. BARRIE: A. Yes.

16 Q. And that if there had been more
17 synchronicity to it or if had gone in a different way,
18 you may not have had this problem?

19 A. Yes, because when we got the second
20 500 kV in November of 1990, the bottling essentially
21 ceased.

22 Q. So that the integration of generation
23 and transmission, even from a planning perspective, is
24 preferable?

25 A. It's vitally important, the two go

1 hand in hand. I don't think anybody said anything
2 different to that.

3 MR. SNELSON: A. Our proposals are to
4 seek approvals of generation and radial transmission to
5 connect it to the bulk supply system in the same
6 process.

7 Q. Now, Mr. Snelson, would you agree
8 with me that the construction of all generation options
9 will have some environmental impact?

10 A. Yes.

11 Q. And the chances are the larger the
12 project, the larger the impact?

13 A. In absolute terms, but not
14 necessarily in per unit terms.

15 Q. Now, you have chosen a planning
16 reserve margin that appears to us to be on the upper
17 edge of a possible reserve margin that you could have
18 chosen.

19 In other words, 24 per cent is at the
20 upper edge of what you could have selected?

21 MR. TABOREK: A. No, I wouldn't describe
22 it as upper edge. I described at length the logic that
23 we used in the 20 to 24 per cent. Upper edge is not
24 part of the terminology.

25 Q. No, I understand that.

1 Can we look at Exhibit 166, which is the
2 material that we presented, page 63. This is material
3 from the plan analysis, Exhibit No. 6.

4 A. Yes.

5 Q. And it is just a listing of reserve
6 margins adopted by various North American utilities,
7 and I just note that Ontario Hydro is at the top of the
8 list, but I suggest it's at the upper edge of reserve
9 margins that you could have selected.

10 A. No. Those words don't mean anything
11 to me the way you are using them.

12 We described the rationale for our
13 choice.

14 Q. Now, I take it a couple of major
15 considerations in the selection of a reserve margin is
16 the size of the utility, that impacts on the reserve
17 margin, the selection, in that, the smaller the utility
18 there tends to be a need for a higher reserve margin?

19 A. Well, size is important, what you are
20 now getting into, a lot of factors are important and I
21 cannot agree that a small utility necessarily has a
22 large reserve margin.

23 Q. But size is important and so is the
24 composition of the generation?

25 A. Yes.

1 Q. Now, I note here on this list, this
2 is on page 63, you list Commonwealth Edison as being a
3 a 15 to 20 per cent reserve margin.

4 A. Yes.

5 Q. On the two following pages, I think
6 you have to really look at page 65, tried to do a
7 graphical representation of Ontario Hydro and
8 Commonwealth Edison, in terms of the generating
9 capacity and the makeup of that capacity. And then, on
10 the previous page, on 64, tried to do an indication
11 that they have a 15 per cent reserve margin.

12 Now, you have had a chance to look at
13 these graphs?

14 A. Yes.

15 Q. And do you have any comments on why
16 it is that Commonwealth Edison with a makeup very
17 similar to Hydro's - if anything I perceive it to be
18 worse because it has no hydroelectric - can get a
19 reserve margin of 15 per cent, whereas you have
20 selected a reserve margin of 24 per cent.

21 A. Yes, we noted that a reserve margin
22 that a utility ends up with or is used by a utility
23 depends very much on the characteristics of the
24 utility. And you are quite right, to the extent that
25 we have hydraulic and that component tends to be

1 reliable, that would be a factor leading us to have a
2 lower reserve margin compared with Commonwealth Edison.

3 There are, however, other factors in
4 addition to that particular one that lead them to a
5 lower reserve margin.

6 Now, first of all, Commonwealth Edison is
7 a utility in the Chicago area and they are part of the
8 reliability group called MAIN. MAIN, in essence, does
9 a broad level of reliability planning and then suggests
10 the margins that utilities should have. And first of
11 all, Commonwealth Edison/MAIN say that 15 to 20 is the
12 minimum. So, that in comparing, first of all, Ontario
13 Hydro with them, I think you should probably, first of
14 all, be comparing our 20 with their 15, which is the
15 minimum we have stated compared to the minimum they
16 have stated. I don't think you should compare 24 with
17 15.

18 Having said that --

19 THE CHAIRMAN: 24 would be comparable to
20 20 then; would it?

21 MR. TABOREK: Yes. And even that might
22 be pushing it because they actually describe 15 to 20
23 as the minimum. But near enough I think, sir.

24 The next factor that is different is that
25 MAIN and Commonwealth Edison are utilities and pools

1 with low load factors. And I have in my direct
2 evidence, which I think Exhibit 136, page 10-- No
3 power. Transmission outage, sir. (laughter)

4 --used this chart to give a graphical
5 illustration of the importance of load factor on the
6 reserve margin. And the effect is simply, this shows
7 the pattern of load during a typical day for a high
8 load factor utility at the top of this curve, and for
9 the same peak load of one, the same load curve for a
10 low load factor utility.

11 The proposition we are making is that if
12 your capacity drops down to be less than or equal to
13 load in each case, that this utility is going to
14 experience problems for a few hours of the day.

15 THE CHAIRMAN: That is the low load
16 factor.

17 MR. TABOREK: The low load factor utility
18 will experience problems for a few hours of the day,
19 and the high load factor utility is going to experience
20 problems for more hours of the day.

21 And Commonwealth Edison, as I understand
22 it, is a summer peaking utility and they have a low
23 load factor of about 53 per cent as a result of the few
24 extreme peaks on a few summer days. The reason this
25 comes about is your unsupplied energy is going to be

1 related to how much of a problem you have. So, we are
2 on a steeper cliff, if you will, than them. So, we
3 would reasonably stay a little further away from that
4 cliff.

5 I made the distinction, while
6 Commonwealth Edison is quite large, they do benefit
7 from the diversity of the pool. What that diversity is
8 that Commonwealth Edison's peak loads don't occur at
9 the same time as the peak loads of the other utilities
10 in the pool, and I think that also gives a benefit.

11 The fourth area is the reliability levels
12 planned to. I have mentioned that -- No, excuse me.
13 The next area I want to address is load forecast
14 uncertainty.

15 The utilities in the U.S., and I
16 mentioned in my direct testimony, use a LOLP type of
17 calculation. They very frequently do not include load
18 forecast uncertainty.

19 I am sorry, that wasn't in my direct
20 evidence, I don't think, so I am just saying it now.

21 And that we, on the contrary, have a more
22 elaborate analysis and we do incorporate load forecast
23 uncertainty.

24 If you were to introduce load forecast
25 uncertainty into Commonwealth Edison's or MAIN's

1 calculations, it would increase the reserve margin.

2 Now, to a degree the type of LOLP they do
3 is supposed to be an all encompassing thing that I
4 think will sometimes be viewed as incorporating load
5 forecast uncertainty. But this gets to the point of
6 they're planning to a different criteria; namely, a
7 LOLP of 1 in 2400.

8 To the extent they are doing that, they
9 do not know that they are at minimum total customer
10 cost. As I have mentioned, our analysis determines or
11 attempts to find minimum total customer cost.

12 So, that on the basis of those factors, I
13 think they would explain it to my mind in considerable
14 degree why Consolidated Edison would have a lower
15 margin than ours.

16 MR. STARKMAN: Q. Mr. Taborek, thanks
17 for the answer. My simple point is--

18 MR. TABOREK: A. Yes or no.

19 Q. --that they have a reserve margin,
20 seemingly at 15 per cent, and they are running and they
21 haven't fallen over the cliff.

22 A. Well, I come back to this rather
23 macabre description of Russian Roulette.

24 Q. So, you think that they may fall off
25 the cliff?

1 A. What I think I have described to you
2 is that there are reasons that they would be at 15 per
3 cent that are roughly analagous to our being -- or in
4 the 15 to 20 per cent with our being in the 20 to 24
5 per cent range. I believe I have described factors
6 which rationalize the difference.

7 Q. But if we adopted their methodology
8 we would end up with 15 per cent, too. Isn't that the
9 point?

10 A. No. No, we wouldn't, because we
11 would use our load factors, we would use our diversity
12 situation.

13 I cannot see going back to a more
14 primitive analysis that doesn't take into account load
15 forecast uncertainty specifically. And again, you
16 cannot, there is no way that we would end up with their
17 number with any kind of analysis that realistically
18 depicted our system.

19 Q. Now again, still I start off with the
20 proposition you selected a number which was at the
21 upper edge of the range. Can you look at page 18 of
22 Exhibit 166. This is Interrogatory 2.7.105. And the
23 question was:

24 "Has Ontario Hydro determined the
25 reserve margin or range of reserve

1 margins which correspond to 25

2 system-minutes of unsupplied energy?"

3 And the answer is:

4 "As can be seen by extrapolating

5 figure 5.3, a reserve margin of 18 to 21

6 per cent will result in an expected

7 unsupplied energy of 25 system-minutes."

8 Now, I take it figure 5.31 is what is in

9 Exhibit 87?

10 A. Yes.

11 Q. Now, I also believe that was one of
12 the areas where an updated figure was provided.

13 A. That's correct.

14 Q. Well, if we can if just look at that,
15 which is on...

16 THE CHAIRMAN: You are looking at the
17 updated figure?

18 MR. STARKMAN: I am looking at the
19 updated figure. The original 5.3 seems to have been
20 sort of two-thirds of the way through.

21 Q. You told us basically in your
22 evidence in chief that a reserve margin was 20 to 24
23 per cent is what, in your judgment, was appropriate.

24
25 ...

1 [12:48 p.m.] MR. TABOREK: A. Yes.

2 Q. The answer to this interrogatory
3 suggests that it's another number?

4 A. No.

5 Q. Can you help me out with what the
6 difference is here?

7 A. If you adopted the 25 system-minute
8 criteria and a reserve margin of 18 to 21 per cent, you
9 would not be at minimum total customer cost. You would
10 be into the high risk, lower reliability part of the
11 total customer cost.

12 Q. If you take figure 5.3 for the year
13 2000, 2001 and you extrapolate out a line to get the 25
14 system-minutes, my eyeballing it indicates that you'd
15 have a number that was much less than 18?

16 A. Extrapolation is always difficult,
17 but it's around 18, 17, just doing it in my head here.
18 You should be aware that these curves tend to -- this
19 is this mountain, our inverse mountain, here, that
20 tends to sweep up quite steeply, it wouldn't be a
21 linear extrapolation.

22 Q. Just so I can get an idea of the
23 parameters that we're talking about, if you just
24 lowered the reserve margin by two points, two
25 percentage points from 24 to 22, or 22 to 20, or 20 to

1 18, then if you assume a peak of thirty thousand
2 megawatts, then that's six hundred megawatts less that
3 you'd bill, is it that straight forward?

4 A. Yes.

5 Q. That's about the size of the Bruce
6 reactor?

7 A. Actually, no the Bruce reactor is
8 eight hundred and something, roughly 700, 800. But
9 usually when you're talking reliability you're making
10 equivalences with combustion turbine units not base load
11 generators.

12 Q. And that is the next question that I
13 wanted to ask you about. The 24 percent reserve
14 margin, as I understand it, a true reserve margin would
15 be all CTUs? Is that correct?

16 A. No.

17 Q. My understanding - it may be overly
18 simplistic - is that you build the system according to
19 your analysis to meet the expected load then you want
20 to add on another reserve margin factor to take into
21 account various contingencies and so from the way I'm
22 looking at it, this extra factor would be all CTUs?

23 A. Yes. Let me answer it this way. I
24 think yes, the changes in reserve margin would effect
25 CTUs primarily.

1 Q. During every year of the plan - I'm
2 talking about the DSP now - are you in the range of 20
3 to 24 percent of CTUs assuming medium load growth?

4 A. 20 to 24 percent of CTUs?

5 Q. No, 20 to 24 percent CTUs. Are
6 there 20 to 24 percent of the generation, is 20 to 24
7 percent of the generation CTUs during every year of the
8 plan?

9 A. No, they're actually two parts there.
10 One is that, having decided on a reserve margin, the
11 mix of base load generation and CTUs is a function of
12 your load shape and the economics of running your
13 system, which is one of the reasons I hesitated a
14 little earlier.

15 In my direct evidence I mentioned how a
16 utility with a low load factor would have a higher mix
17 of peaking generation and a utility with a high load
18 factor would have a lower mix of peaking generation for
19 a given peak load. And then the other thing in each
20 and every year of the plan, this picks up the point I
21 made earlier that you are planning for 24, you're
22 adding units and the world is changing while you're
23 adding things and you will, in effect, vary about your
24 target level depending on how the world evolves.

25 Q. So, it's reasonable to assume that

1 some of the 24 percent reserve margin is nuclear or
2 coal during the planning period?

3 A. Ultimately all of your capacity of
4 whatever sort totals up to give you your capacity with
5 the reserve margin suitable for the load. It's all
6 included, ultimately.

7 Q. But I'm trying to focus on what is in
8 the reserve of margin, and you're saying?

9 A. Everything is in the reserve margin,
10 everything you have.

11 Q. Everything you have. But do you know
12 what percentage of it is CTUs during any given year of
13 a plan?

14 A. Yes. You can look in later parts of
15 the plan there will be year by year capacity by type
16 and you would be able to determine the percent of
17 different types.

18 MR. SNELSON: A. That is the per cent
19 capacity in the system as a whole. You could never
20 point to a piece of generation and say this is reserve
21 generation and this is not reserve generation. They
22 are never separately identified in planning. You plan
23 the total generation to be sufficient and you will vary
24 the mix to find the best mix to give you the right sort
25 of system but you never actually point to these and say

1 these are reserve generating units and these are not.

2 In the general classification reserve
3 tends to be higher fuel and cost generation such as
4 combustion turbines, and may also include things like
5 peaking hydraulic that is best used for peaking
6 purposes or in some cases reserve purposes, but they
7 are not separately identified.

8 Q. But it could include nuclear as well?

9 A. You would not, generally, find it
10 economical to build a nuclear plant if you didn't
11 expect to run it a very large proportion of the time
12 that it was going to be available.

13 Q. What I'm really trying to get at -
14 maybe I should be more clear about it - if you are
15 telling us you're concerned about falling off a cliff
16 which is why you need this really large reserve margin
17 and you also showed us that it cost about \$30-million a
18 year on a levelized cost basis to install CTUs and it
19 takes about four years to install them provided you can
20 get the approvals and that it is really to deal with
21 the unforeseen contingencies than why mix it all up.

22 Why not just say we are going to put in a
23 reserve margin of CTUs which we hope we don't have to
24 use and which are relatively inexpensive to construct
25 compared to the cost of a nuclear facility and just be

1 done with it at that.

2 A. We put in the most economical mix of
3 generation, that combustion turbine will have to run
4 sometimes, it isn't always reserve, sometimes it will
5 have to run, that's why it's provided.

6 Q. Our concern is that you're using a
7 high reserve margin number to justify the need to
8 build large nuclear facilities.

9 MR. TABOREK: A. First of all, a reserve
10 margin is the appropriate number and this reserve
11 margin is by and large dictating the addition of CTUs.
12 If you were to lower or increase the reserve margin
13 from the ones we've stated here you would change the
14 number of CTUs in the system. So that what we're doing
15 is where reserve is a reliability problem, is a peaking
16 problem, excuse me, reserve reliability peaking and
17 we're installing peaking type units for that. Energy
18 is a separate problem and that will be dealt with in
19 later panels in developing a plan. There's a
20 distinction between peak and reserve and energy.

21 Q. Now, the first pages of Exhibit 166
22 is a report from the Select Committee Legislature,
23 1976 -- I apologize for some of the photocopying
24 although I would say that's how we received it in
25 response to Interrogatory 2.7.112

1 The parts I want to refer to, I think,
2 are readable. From reading this I understand or am I
3 correct in understanding that during the 1970s Ontario
4 Hydro was using a reserve margin of twenty-five to
5 thirty per cent?

6 A. Yes.

7 Q. And it was based on this reserve
8 margin that, in part, they justified the construction
9 of Pickering and Bruce?

10 A. No. The justification is basically a
11 result of looking at load growth, looking at the
12 existing system and working through a combination of
13 generation just as we are looking at the DSP that does
14 the total job required. In fact, the equivalent of the
15 CTU at the time was a coal fired unit with a lead time
16 of six years.

17 Q. Do you know how hydro calculated the
18 twenty-five to thirty per cent reserve margin?

19 A. Using LOLP-type techniques.

20 Q. I just wanted to ask you about the
21 purchase from Manitoba, and I know we're going to get
22 into this in it's own separate panel, but assume the
23 purchase from Manitoba has approved a 1000 megawatts.
24 Did Hydro add a 24 per cent reserve margin to the 1000
25 megawatts of firm purchase in doing their calculations?

1 A. As in the evaluation of any specific
2 option, we take into account the specific
3 characteristics of that option in doing its evaluation,
4 in doing our evaluation, so the Manitoba purchase is
5 judged to be a very reliable purchase.

6 Q. So, is the answer no you didn't add
7 24 per cent to the purchase?

8 A. I'm making the distinction between
9 the evaluation of an option and the determination of an
10 appropriate reserve level for the system - and in the
11 evaluation of the option and that will be discussed in
12 Panel 7 - we took into account the specific reliability
13 characteristics that we expected of that Manitoba
14 purchase option, and I believe it was considered to be
15 a highly reliable option but I don't have the specific
16 details.

17 Q. I must say -- I still -- is the
18 answer yes, no, or I don't know?

19 A. In evaluating the option, we took
20 into account its own reliability characteristics as we
21 would any other option.

22 Q. Did you add 24 per cent reserve
23 margin to the 1000 megawatt firm purchase from
24 Manitoba?

25 A. Not in evaluating the option.

1 Q. In respect to the reserve margin do
2 you anticipate upgrading the transmission from Manitoba
3 so that greater emergency support or interconnect
4 support might be available?

5 A. Part of the plan is to make a major
6 addition to the transmission from the Manitoba border
7 to the Sudbury area, and that is not for emergency
8 support purposes, that is to be able to carry the
9 purchase.

10 Q. I'm sorry, I just missed the last
11 part of the answer, that means that the line will be
12 upgraded so that will make the power from Manitoba more
13 available on an interconnect basis, more reliably
14 available on an interconnect basis?

15 A. The primary purpose of the
16 improvement in the transmission system is to deliver
17 the power from the Manitoba border to the Sudbury area.

18 Q. The 1000 megawatts?

19 A. Yes.

20 Q. But the line will be capable of
21 carrying even more power than that?

22 A. The line will be capable of carrying
23 more power than that, yes.

24 Q. How much more?

25 A. I believe the total delivery

1 capability would be about 1500 megawatts.

2 MR. STARKMAN: Mr. Chairman, this might
3 be a convenient time for lunch.

4 THE CHAIRMAN: 2:30.

5 THE REGISTRAR: The hearing will adjourn
6 until 2:30.

7

8 ---Luncheon recess at 1:00 p.m.

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1 ---On resuming at 2:30 p.m.

2 THE REGISTRAR: Please come to order.

3 This hearing is now in session. Please be seated.

4 THE CHAIRMAN: Mr. Starkman.

5 MR. STARKMAN: Mr. Chairman, I am hopeful
6 that I will finish my questions this afternoon,
7 although, I think they would take the rest of the
8 afternoon. Mr. Harry Poch, representing the City of
9 Toronto, was here and I just was...

10 THE CHAIRMAN: You think you are going to
11 take the rest of the afternoon?

12 MR. STARKMAN: I would think so.

13 THE CHAIRMAN: Are you up next, Mr. Poch?

14 MR. H. POCH: Yes, I am, Mr. Chairman.

15 THE CHAIRMAN: Well, in that case, on
16 that basis then, I won't make you sit around all
17 afternoon if he is going to take most of the afternoon.

18 MR. H. POCH: I appreciate that very
19 much.

20 I provided counsel for Hydro with the
21 materials that I may refer to tomorrow in
22 cross-examination, as I have to the clerk.

23 THE CHAIRMAN: All right. Now that we
24 are on the subject, the Ontario Public Health
25 Association, I understand will not be asking questions;

1 is that right. Is there anyone here?

2 MR. IZZARD: Yes, Mr. Chairman. Can I be
3 heard on the record?

4 THE CHAIRMAN: Yes, certainly.

5 MR. IZZARD: I am just curious with
6 regard to the microphone.

7 THE CHAIRMAN: I think if you speak
8 loudly you will probably get on the record.

9 MR. IZZARD: Mr. Chairman, my name is
10 Michael Izzard, I am the research manager for the
11 Ontario Public Health Association and the International
12 Institute of Concern for Public Health. I have spoken
13 with our solicitor, Martin Campbell, and he has asked
14 me just to say to the Board that we have no questions
15 for this panel. In our statement of concerns for Panel
16 2, most of the subject matter has been put over to
17 further panels. So, we will be saving our questions
18 for later panels. Thank you.

19 THE CHAIRMAN: Thank you.

20 Mr. Harry Poch has left but I understand
21 that he expects to take about an hour; is that right,
22 about an hour?

23 The next is the Consumers' Association.

24 MR. MONGER: Yes, Mr. Chairman, they will
25 be sometime between half an hour and an hour.

1 THE CHAIRMAN: And then the
2 Northumberland Environment Protection. Their
3 representative is not here? She was here this morning,
4 I thought I saw her here.

5 All right. Do we have any understanding
6 of what length of time they are going to take?

7 MR. MONGER: Mr. Chairman, I believe she
8 is in one of the meeting rooms. Why don't I see if I
9 can find her.

10 THE CHAIRMAN: Thank you, Mr. Monger.

11 Mr. Estrin, you are here for the North
12 Shore; is that right?

13 MR. ESTRIN: Yes, although I believe Ms.
14 Marlatt will be doing the questioning. I don't believe
15 she is going to be very long. I haven't spoken to her
16 today, but I think it can't be longer than half an
17 hour.

18 I left off Nishnawbe. Are they here this
19 afternoon?

20 MS. OMATSU: He is in the office, I
21 believe. But he was expecting about an hour.

22 THE CHAIRMAN: About an hour?

23 And then OMAA, and then Mrs. Mackesy and
24 then Mr. Hunter, and then the government.

25 MR. STARKMAN: Mr. Chairman, also on

1 scheduling, Mr. Rodger from AMPCO indicated to me that
2 he had about 10 or 15 minutes of questions that he
3 wished to asked with respect to the panel undertakings
4 that were given, and he couldn't be here tomorrow and
5 he asked if I would object to making time for those
6 questions towards the end of today.

7 THE CHAIRMAN: When you finish we can
8 take Mr. Rodger. How would that be? Would that be all
9 right?

10 MR. RODGER: I would like to try to get
11 the questions in today, if I could, Mr. Chairman. I
12 have an appointment outside of the office.

13 THE CHAIRMAN: We will see that that
14 happens.

15 MR. RODGER: Thank you.

16 The representative of Northumberland, how
17 long do you expect to be in your cross-examination?

18 MRS. DEQUEHEN: I think it will depending
19 very much on (inaudible) So as it is, I imagine about
20 an hour.

21 THE CHAIRMAN: Pardon?

22 MRS. DEQUEHEN: About an hour.

23 THE CHAIRMAN: Yes. All right. That
24 will be fine.

25 MRS. DEQUEHEN: It could be less.

1 THE CHAIRMAN: All right, Mr. Starkman.

2 MR. STARKMAN: Thank you, Mr. Chairman.

3 Q. Mr. Taborek, I know you described
4 several times how the reserve margin was developed, and
5 I guess you said several times that there a fair amount
6 of judgment that goes into making this determination.

7 MR. TABOREK: A. Yes.

8 Q. And I would just like to explore, for
9 a minute, the types of judgments that went into
10 arriving at the 24 per cent and the 25 system-minutes.
11 Can we first look at Exhibit 140, page A, it's page A4,
12 which is the 1981 Reliability Criterion, and I am
13 looking at paragraph 2.7, page A4. And, therein, the
14 author of the report in 1981 says that: "The total
15 costs of energy, including customer losses, figure 2,
16 are shown to be --

17 THE CHAIRMAN: I'm sorry, Mr. Starkman,
18 I am terribly sorry to interrupt you. I am at Exhibit
19 140 and I don't seem to have it.

20 MR. STARKMAN: Page A4.

21 THE CHAIRMAN: At the front, all right.

22 MR. STARKMAN: Yes, it's near the front.
23 It's basically under the recommendations.

24 THE CHAIRMAN: I have it now. Thank you.

25 MR. STARKMAN: Q. "The total cost of

1 energy, including customer losses, are
2 shown to be close to optimum, over the
3 the range of 20 to 50 system-minutes.
4 The selected level of 25 is toward the
5 higher reliability end, lower
6 system-minutes of the band where the
7 customer damages are less and hence the
8 cost is less sensitive to the
9 uncertainties in estimating customer
10 damage costs."

11 And so on, I guess what I am asking you
12 is, am I correct that when this analysis was done in
13 1981 there was a range of 20 to 50 system-minutes all
14 of which would minimize total customer cost, but that
15 25 was selected. Do you I have it right, that is what
16 it says?

17 MR. TABOREK: A. Essentially, yes,
18 except there is actually one number which minimizes,
19 over the range there is not a great deal of difference
20 for the minimum.

21 Q. I'm sorry. Could you repeat the last
22 part of the sentence?

23 A. Perhaps I am being pedantic, but
24 there will be one number which is the minimum by
25 definition, so that the whole range isn't the minimum.

1 The whole range is close to the minimum.

2 Q. All right. But am I right that if
3 Hydro had chosen a number of 40, rather than 25, it
4 would have resulted in the same, approximately the same
5 customer costs?

6 A. Approximately.

7 Q. And that Hydro's selection of the 25
8 system-minutes as the planning criteria resulted in
9 higher energy supply costs and lower customer outage
10 costs, somewhat lower customer outage costs?

11 A. Again, we are talking about very
12 small differences over the range.

13 MR. SNELSON: A. You could see the
14 differences in proportion in figure 5-1 which was the
15 figure that used to determine that statement.

16 Q. Yes. But what I am getting at is,
17 are you really saying to us that there is very little
18 difference between 20 and 50?

19 MR. TABOREK: A. The word "very little
20 difference", with respect to the minimum or with
21 respect to the results of the analytical work, there is
22 little difference. If you now go on and say, with
23 respect to making a judgment of where you should be,
24 there is a great deal of difference.

25 Q. Yes.

1 A. And I dealt with this at some length
2 as to choosing the factors that entered into your
3 choice of where you were, and it, in essence, I guess,
4 bears on three factors.

5 One, that the analysis will tend to
6 understate the true minimum, so that should be borne in
7 mind. The fact that you are putting yourself into the
8 region where the risk of getting high customer damage
9 costs is more, and that it can increase very sharply at
10 one end as opposed to other. And then, the judgment as
11 to whether if the costs are the same, it is appropriate
12 to be a little more safe or a little -- or more
13 reliable or less reliable.

14 So, it is important in those effects, but
15 in a strict, read the results off the graph and the
16 calculation, you are quite right.

17 Q. So, the modelling exercise, you are
18 saying, would indicate very little impact, but the
19 major criteria that was used here was judgment in terms
20 of the selection of a 25 as opposed to the selection of
21 a 40 or 50?

22 A. Well, not major. I think all three
23 things were used, and the analysis had a major part to
24 play. It was a major factor in our decision-making,
25 but judgment similarly played a major role.

1 Q. Can we look at figure 3.4, which is
2 in the plan analysis, Exhibit No. 6, page 3-7?

3 A. Yes.

4 Q. Now, this figure is, if you like,
5 very similar to the figure that you have referred to in
6 your evidence in chief.

7 A. Yes. This is a stylized figure such
8 as I used in my direct.

9 Q. And your figure, just for reference,
10 was Exhibit 136, page 29, was the overhead, and it
11 didn't have the dotted lines on it but other than that
12 it is the same figure?

13 A. Correct.

14 Q. Now, first of all, can you help me
15 out, there are no numbers on the vertical or horizontal
16 axis here.

17 A. That's correct.

18 Q. Can you help me fill in what they
19 would be? What they looked like? I am talking about
20 the higher/lower cost, high reliability, low
21 reliability.

22 A. This is meant to be a stylized
23 representation. The numerical derivative of this, if
24 you will, is in Figure 5-1 of Exhibit 87.

25 Q. And does this one show that the range

1 of lowest customer cost is anywhere, as it indicates,
2 between those lines?

3 A. Yes.

4 Q. And does that equate to your 20 to 24
5 per cent?

6 A. Roughly speaking, yes.

7 Q. Now, I wanted to ask you a bit about
8 the derivation of the \$5.91, and I think there is some
9 material in Exhibit 166, which is the material that we
10 provided, page 122. This was a response to
11 Interrogatory 2.14.105.

12 A. Excuse me, what is the page number?

13 Q. 122.

14 A. I'm sorry, I don't go up to --

15 Q. I am looking at Exhibit 166, page
16 122, it starts off Table 1, Customer Interruption Cost
17 Function.

18 THE CHAIRMAN: And this comes from?

19 MR. STARKMAN: This is a partial response
20 to Interrogatory 2.14.105. I don't believe I
21 reproduced the whole answer because it was quite thick.

22 Q. Have you got that.

23 MR. TABOREK: A. I have that.

24 Q. Am I right that the derivation, if
25 you like, of the \$5.91, if you look down to the set of

1 numbers at the bottom of the page, which is the
2 weighted CICF 1990 dollars per kilowatthour, and you
3 look in the far right-hand column, it's \$5.91.

4 A. Yes.

5 Q. Is that where it comes from?

6 And would you agree with me that setting
7 the number at this level represents, if you like, a
8 subsidy from the residential to the commercial
9 industrial users?

10 A. No.

11 Q. Why do you say that?

12 A. Well, I don't know why I wouldn't say
13 it.

14 Q. I guess when I looked down the
15 residential numbers, which are in the third column from
16 the left, it indicates that they would pay a relatively
17 small amount of money, it was a small sum associated
18 with a one hour interruption to the residential; am I
19 correct in that?

20 A. Yes.

21 Q. That's .01 and .03 and .18. Yet you
22 set the number is \$5.91 which doesn't represent there
23 anything like the cost to the residential sector of a
24 one hour interruption.

25 A. Yes.

1 Q. So, haven't you set the number at a
2 very high level, because from a residential sector
3 point of view, they would be willing to incur those
4 types of interruptions, put it that way, as opposed to
5 some of the other sectors where there is a much greater
6 cost associated with them?

7 A. I think I would not describe this as
8 a subsidy. I would describe it as a policy of equal
9 treatment of all people. Such as, for instance, in
10 health care you do not adjust your rates to the
11 people's willingness to pay.

12 Q. Well, no one would pay \$5.91 per
13 kilowatthour for interruptions, do you agree with me on
14 that?

15 A. No one would pay?

16 Q. Yes.

17 A. On the average, the public would pay
18 that amount for interruptions.

19 Q. That's what your data shows you?

20 A. That was the answers they gave us to
21 our survey.

22 Q. On the average. But what I am saying
23 is that it is -- the residential wouldn't pay that
24 much?

25 A. No.

1 Q. And neither would, if you like, the
2 small users?

3 A. Correct.

4 Q. So, the people who might pay that
5 much --

6 A. Well, if I might, these again are
7 averages for those classes, and so those averages would
8 again represent a range, and I am sure that there would
9 be residential people who would pay \$5.91 or more. I
10 am sure there are small users who would pay \$5.91 or
11 more. What you have are the average responses for the
12 classes.

13 Q. Just to try to get a handle on what
14 the number means. Does anyone pay \$5.91 per
15 kilowatthour for electricity, do they actually pay that
16 amount?

17 A. Oh, no. The price of electricity,
18 what they pay for electricity is about five cents a
19 kilowatthour.

20 Q. Yes.

21 A. This is what they would pay not to
22 have the interruption.

23 Q. Do you think anyone would actually
24 pay that amount?

25 A. I am not sure if I am understanding

1 [2:54 p.m.] A. The terms of the discount demand
2 service, which is the new name of interruptible
3 customers, chosen to transfer to the customer the
4 benefits and saving of peak generation reserve
5 generation that is produced by them being interruptible
6 instead of firm.

7 Q. And that's a benefit to the system?

8 A. It's a benefit to the system in the
9 first place which is transferred to them as a discount
10 on their demand charge and a payment when they're
11 interrupted.

12 Q. And it's a benefit to the system
13 because Hydro, therefore, doesn't have to build as much
14 supply?

15 A. It's based upon the cost of building
16 combustion turbine units.

17 Q. And I'm trying to get a handle on the
18 \$5.91 and what it means. Have you looked into say
19 offering to pay people \$5.91 per kilowatthour to become
20 an interruptible load customer?

21 A. Not to my knowledge.

22 Q. Because isn't that the flipside of
23 the coin if you're saying that an interruption -- the
24 cost of a 1 hour interruption is \$5.91, then if you
25 paid people \$5.91 and didn't have to build supply to

1 serve them, that's the flipside of coin. That's what
2 you estimated the value of the electricity to be?

3 A. We have estimated that the average
4 interruption cost to thw customers is \$5.91 which is an
5 average of -- if you look at the table above that for
6 one hour interruptions it varies from \$25 for offices
7 down to 57 cents for residential.

8 Q. I understand, Mr. Taborek told me
9 this was an average not only was it an average within
10 each of the categories but the \$5.91, if you like, was
11 an average of all the categories averages to get the
12 \$5.91.

13 A. Yes, the \$5.91 is the average of the
14 numbers on the table in the middle of the page the
15 1-hour line that runs from 57 cents for residential
16 customers up to \$25 for offices.

17 THE CHAIRMAN: You're ahead of me now.
18 You have to look up at the table up above.

19 MR. SNELSON: The table up above is the
20 data on the cost of interruptions to those classes of
21 customers in 1990 dollars per kilowatt.

22 THE CHAIRMAN: But the table at the
23 bottom which produces the \$5.91 figure--

24 MR. SNELSON: Yes.

25 THE CHAIRMAN: --is the addition of all

1 those numbers across there, isn't it?

2 MR. SNELSON: I believe that each column
3 is weighted by the contribution to consumption which is
4 shown just above the bottom table, so that the line of
5 numbers adds to \$5.91.

6 THE CHAIRMAN: Yes.

7 MR. SNELSON: So the way the residential
8 customer works is that the 57 cents residential
9 customer weighted by his contribution to come to
10 consumption of .310, produces .18, and then that line
11 of numbers adds to \$5.91.

12 THE CHAIRMAN: And that tells you across
13 the system what it's costing you to have one kilowatt
14 out for an hour?

15 MR. SNELSON: The \$5.91 yes, assuming
16 that all customers are interrupted in proportions to
17 their contribution to load.

18 MR. STARKMAN: Q. Let me look, for a
19 brief minute, at public the appeals and the way you
20 have done that calculation. Mr. Taborek you said that
21 the Demand/Supply Plan used 25 minutes, right?

22 MR. TABOREK: A. Yes, system-minutes.

23 Q. System-minutes. That was based on
24 1981 survey?

25 A. Yes.

1 Q. And you updated the numbers to
2 1990?

3 A. Yes.

4 Q. Did you run the F&D model when you
5 were preparing the Demand/Supply Plan?

6 A. Yes.

7 Q. Am I right the whole plan is based
8 on 25 system-minutes as it is written?

9 A. Yes. It is based on three things and
10 to separate out one, I don't think is appropriate.

11 It is based on number one, the concept of
12 minimum total customer cost, it then determines the
13 system-minutes appropriate to that. When you first did
14 it, it would have been 25 it is now 10. And then it is
15 based on reserve margin and it was based on 20 to 24
16 and it remains based on 20 to 24.

17 Q. That's the point I'm trying to
18 explore. You wrote the whole plan based on 25
19 system-minutes. I understand you have changed it
20 subsequently.

21 A. You're just pulling one of three
22 things and that's not fair. The stool falls if you
23 pull out one of the legs.

24 Q. I do not intend to ignor the other
25 things. What I'm suggesting is that the whole plan

1 refers to to 25 system-minutes as it is written.

2 A. Yes. The original documents tabled
3 25.

4 Q. The question I want to ask is, why
5 did it take Hydro so long to come around to 10
6 system-minutes?

7 A. The period from where to when.

8 Q. The plan was several years in the
9 making; is that correct?

10 A. Yes.

11 Q. You ran the F&D model, as you told us
12 numerous times, in making the plan?

13 A. Yes.

14 Q. Why is it that you didn't come around
15 to the 10 system-minutes sometime in the development of
16 the plan?

17 A. The reason for that is there is an
18 iterative process involved. When you have completed
19 the plan then you ever better information on what it is
20 you are modelling or what reliability you are
21 analyzing.

22 In particular the first runs were based
23 on the capacity, reliability being provided by coal
24 fired generation with a lead time of eight years, at
25 that particular point in the analysis. Having

1 completed the plan we realized that the incremental
2 reliability was being provided by combustion turbine
3 units with a 4-year lead time.

4 Then, having that information, with the
5 completion of the plan we could then go back and redo
6 the calculations. The other reason is that we decided
7 to do a very thorough review of the numbers because we
8 were aware that people would want to satisfy themselves
9 that they were reasonable and so we did the work
10 reported in Exhibit '87. It was the conclusion of that
11 work that led us to the point we're at now.

12 Q. It was just convenient that the
13 reduction of the public appeal effective rate from ten
14 per cent to two per cent conveniently offset the
15 construction time on the CTUs and left you still with
16 20 to 24 per cent reserve margin?

17 A. No.

18 Q. What have I missed?

19 A. What is the question?

20 Q. Well, I think you told us that after
21 you prepared the plan and filed it you realized that
22 the reserve margin wasn't going to be coal fired, it
23 was going to be otherwise and that the construction
24 time would be reduced from eight years to four years.
25 If that was the only change you made then that would

1 have significantly reduced the reserve margin, wouldn't
2 it, that was required?

3 A. Well --

4 Q. But, if that was the only change --

5 THE CHAIRMAN: Would you finish your
6 answer please?

7 MR. TABOREK: That wasn't the only change
8 we made. We did a thorough review of all the changes
9 that had occurred and documented them in Exhibit 87.
10 There is a whole chapter relating to review of the
11 reliability calculation and there are nine paragraphs
12 and the tenth is a summary which, in effect, discusses
13 areas of change.

14 MR. STARKMAN: Q. Can we look at your
15 assumptions about reserve margin, because you've told
16 us that you changed your assumptions. Excuse me, on
17 public appeals, you changed your assumption from ten
18 per cent to two per cent?

19 MR. TABOREK: A. That's correct.

20 Q. I'd like to look in Exhibit 166 at
21 page 25. It has got a very weak number at the top but
22 it's, basically, the document is a Hydro document
23 entitled "Power Systems Operation Division." Have you
24 got that there?

25 A. Customer appeal procedures.

1 Q. Yes customer appeal procedures.

2 A. Mr. Barrie may pick up from here.

3 MR. BARRIE: A. This is a document from
4 my division.

5 Q. That was, in part, a response to
6 Interrogatory 2.7.99, which, I guess, is on the
7 previous page.

8 What I'm interested in here, under the
9 definition part, you define a customer appeal as a
10 communication to elicit custom support for voluntary
11 load curtailment. That is under 2.1. Then you have a
12 public appeal. This is general request for voluntarily
13 load curtailment. I take it an industrial appeal is
14 included within a public appeal?

15 A. No.

16 Q. Something else?

17 A. A customer appeal is the general term
18 we use for all such is appeals. So, that's why they
19 title of this whole document is customer appeal
20 procedures. Within that, we split it between public
21 appeals and industrial appeals.

22 Q. On the next page under guidelines,
23 there is a note there which says the relief - this is
24 in paragraph 3.2 - the relief typically expected from a
25 customer appeal is as follows: Public appeal, about 2

1 per cent of system demand; Industrial appeal up to a
2 maximum of 4 per cent of system demand. In general,
3 the expected contribution is one per cent of system
4 demand for an industrial limited appeal and up to an
5 additional three per cent of system demand for an
6 industrial full appeal?

7 A. Correct .

8 Q. And yet, I believe, when you did your
9 calculations on reserve margin you didn't -- those
10 numbers add up to 6 per cent and you used, I believe, a
11 number of 2 per cent for public appeals?

12 MR. TABOREK: A. Yes.

13 MR. BARRIE: A. Yes. In the calculation
14 of the reserve margin, 2 per cent was used, yes.

15 Q. This seems to indicate that there was
16 6 per cent potentially.

17 A. In this document we estimate 2 per
18 cent for public appeal, then of the industrial appeal
19 it's split into two parts limited and full. For the
20 limited we expect only 1 per cent. Limited means that
21 we're not asking the customer to effect his production.

22 So, it's a request to go around and
23 switch off lights and do whatever he can without
24 fundamentally altering his production process. A full
25 appeal will involve reducing electricity consumption at

1 the expense of his production.

2 That is not factored into that 2 per
3 cent, that second part, because we regard that as it is
4 starting to impact on the customer to the extent that
5 it is becoming a load cut and distinct from an appeal.

6 So, if you want to equate something to
7 the 2 per cent, I suggest it's the public appeal of 2
8 plus the limited industrial of 1.

9 Q. So, that's three per cent?

10 A. That's right.

11 And when we wrote this document, I think
12 it's dated 1987, that was our expectation. The recent
13 events - by recent I mean 1989 - indicated that we did
14 not get that amount when we put this into practice.

15 These are estimates. We do not do trial
16 runs on public appeals.

17 Q. I know, you said that.

18 A. So, we had virtually zero evidence.
19 This was a pure estimate when it was written. In 1989
20 when we actually used it, we found that 1 Or 2 per cent
21 was a better actual number that we actually achieved.

22 Q. I understand that. The numbers of
23 appeals are set out in the answer to Interrogatory
24 2.7.99.

25 My question is this, you haven't had any

1 full industrial appeals, no experience with full
2 industrial appeals?

3 A. No, we didn't use it even in 1989
4 when we were in need. We did not use it.

5 Q. The second point is, that even a full
6 industrial appeal is still a voluntary mechanism; am I
7 correct in that?

8 A. Well, I think we're rethinking the
9 application of a full industrial appeal.

10 Although it's written out here as part of
11 customer appeal--

12 Q. I am looking at the definition which
13 is under B at the top.

14 A. --I am telling you that, in practice,
15 we have not used it as an appeal process.

16 Q. You haven't used it?

17 A. No.

18 Q. You define it at the top of that
19 page?

20 A. Yes.

21 Q. As a request to industries to
22 voluntarily reduce electricity consumption even at the
23 expense of lowering or rescheduling production.

24 What I'm emphasizing is that it's still a
25 voluntary appeal?

1 A. Yes.

2 Q. And that what you're suggesting is it
3 is not free, perhaps, because there might be some cost
4 associated with it?

5 A. That's the distinction we're making.
6 The customer can do the first one at little or no cost
7 to himself, whereas, this is a very definitely a cost
8 to the customer.

9 Q. There may be a cost associated with
10 it from lowering or rescheduling production?

11 A. That's correct.

12 Q. But, wouldn't you agree with me that
13 that cost would be less \$5.91?

14 A. No. It would vary from customer to
15 customer. I don't know whether the average would be
16 greater or less than \$5.91.

17 Q. So, you really haven't thought about
18 that or looked at it?

19 A. I haven't, no.

20 Q. I take it that there has been no
21 instances of rotating power cuts that you've referred
22 to?

23 A. In the last ten years there have been
24 no rotating load cuts caused by generation short fall.

25 Q. But would you agree with me, that if

1 you did have rotating load cuts the effectiveness of a
2 customer appeal or a public appeal would likely
3 increase dramatically.

4 A. If we were in the process of carrying
5 out rotating load cuts, it would certainly bring a much
6 higher focus to our energy problem than if we didn't
7 have them.

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1 [3:10 p.m.] And I suspect yes, that it would have a
2 bigger impact but I have no evidence to support that,
3 just the logic of what you have just said, yes.

4 MR. TABOREK: A. But it would remain a
5 cost associated with it even if it were done. The fact
6 that it is voluntary, it would still have a cost
7 associated with it. That's the other part of the
8 logic.

9 Q. You are talking about the industrial
10 appeals?

11 A. Yes.

12 Q. Yes, I agree with that. My
13 suggestion was it would be less than the \$5.91. But
14 the question I was really asking Mr. Barrie was that
15 the public appeal, meaning to the non-industrial
16 customers would, likely, be more effective if you were
17 also implementing rotating load cuts and --

18 MR. BARRIE: A. I tend to agree with you
19 but I have no hard evidence.

20 Q. Now, I guess, Mr. Snelson, I know
21 this question was asked previously and had it to do
22 with double counting, and you sort of started to answer
23 the question, I am talking several days ago now. I
24 didn't understand the answer, so let me try and ask it
25 again and maybe you can recall the answer.

1 The question I think was, when they do
2 the load forecast, there is an indication of a
3 bandwidth representing the uncertainty factor in the
4 forecast. And yet, when you determine reserve margin
5 you also build in a factor for uncertainty, and the
6 question is, why isn't this double counting?

7 MR. SNELSON: A. When planning today for
8 an adequate generating system that is in the future,
9 let's say we are planning for the system four years
10 away and that any decisions we make today will be
11 effective in four years, but any decisions we make next
12 year won't be effective until four years from then,
13 which will not be in the fourth year from today, then
14 we are making those decisions looking at the full range
15 of uncertainty in the load forecast. And the decisions
16 that we make today about committing generating capacity
17 have to cover the full range of possible load
18 variability between now and four years from now.

19 Q. So, it's only with respect to the
20 4-year uncertainty, the load forecast that you're --
21 it's only the 4-year uncertainty that you are taking
22 into account with respect to the calculation of the
23 reserve margin?

24 A. Yes.

25 Q. And where does that 4-year

1 uncertainty number come from? Can you help me out? I
2 am looking here at Exhibit 136, page 33, which was
3 another overhead. And, Mr. Taborek, I think you talked
4 to this.

5 MR. TABOREK: A. Yes, it is the time it
6 would take us to add new generation to the system,
7 allowing us to respond to uncertainties.

8 Q. Yes, but you say in calculating the
9 uncertainty you have got uncertainty in the operating
10 year, 17 per cent; right?

11 A. Yes.

12 Q. Uncertainty in the forecast year is
13 15 per cent. Where does the 15 per cent number come
14 from?

15 A. The 15 per cent number?

16 Q. Yes.

17 A. There is a chart, just previous, that
18 indicates the errors that we had made in forecasting
19 load in generation, in the forecast that we had done in
20 the 1981 to '85 period for the years, four years hence.

21 Q. Can you look at that with me? It's
22 page 33 of Exhibit 136.

23 MR. SNELSON: A. Page 33?

24 Q. Yes.

25 A. Of 166.

1 Q. Of 136.

2 A. 136, I'm sorry.

3 Q. Yes. And that's where the 15 per
4 cent comes from.

5 MR. TABOREK: A. Yes.

6 Q. But what I notice in just looking at
7 it, is that there is a 15 - even assuming all your
8 other numbers - there is a 15 per cent in one year,
9 that's '85 to '89, all the others are much less.

10 A. That's correct. Reliability is
11 planning for the unlikely -- the less likely things
12 that will happen to you, that you can view these as a
13 sample of a larger population of events.

14 In reaching in for the sample of five we
15 found one with 15 and ergo we say, "Look, you can have
16 a 15." And in that kind of sample it's appropriate to
17 plan for that. It's happened before, it can happen
18 again.

19 And of course, things can happen to you
20 which are favourable. But in this particular sample
21 there are not any.

22 Q. But when you look at the number, the
23 '85 forecast for '89, am I correct that most of the
24 problems in delay and forced outages were with respect
25 to nuclear plants?

1 A. Yes. Most of the the under
2 forecasting of capacity was with respect to nuclear.

3 Q. That's the availabilty of the nuclear
4 and the operation of it?

5 A. Yes.

6 Q. And particularly, the retubing, am I
7 right on that? It's one of things that drove up the
8 number, if you like, in 1989?

9 A. I think I would have to check that.
10 Yes, it would be nuclear retubing.

11 Q. And that's something you also told us
12 that you now have under control in a sense that there
13 is a plan to deal with that problem.

14 MR. SNELSON: A. 500 megawatts of that
15 would be Pickering 3 retubing.

16 Q. And what percentage would be delays
17 in Darlington?

18 A. I would expect it to be 881
19 megawatts.

20 Q. Sorry?

21 A. 881 megawatts.

22 Q. So, 881 plus 500 is the percentage
23 that was related to the nuclear problem?

24 A. That's the percentage relating to
25 retubing, 500 megawatts, and Darlington delays, 881

1 megawatts.

2 Q. But nevertheless, Mr. Taborek, you
3 feel that it is appropriate to take a look at these
4 numbers, that's the '81 forecast through the '85
5 forecast, go in and take the highest one, 15 per cent ,
6 and then use that as representing the total uncertainty
7 in the forecast year?

8 MR. TABOREK: A. Yes, it is, indeed.
9 That's the way the reliability calculations are done.

10 Q. And isn't the long-term forecast, of
11 that load forecast, supposed to take this type of
12 problem into account? I understand that it's supposed
13 smooth out the year to year fluctuations and take into
14 account these types of problems over the long term?

15 A. That's with respect to the load
16 forecast which is the second column on this chart.

17 Q. Yes. And the long-term load
18 forecast, I believe Mr. Rothman and Mr. Burke
19 described, did do that.

20 Q. But it's not double counting? I am
21 still back on this double counting.

22 A. No, it is not doubling counting.

23 If you look at the history, if you go
24 back to the earliest history of Hydro, in years when
25 there were liability problems you will read the words,

1 'the load was higher than forecast and generation was
2 less than expected.' Those are the two generic things
3 that contribute to reliability problems, past, present
4 and will in the future.

5 Q. Mr. Taborek, can we look at Exhibit
6 166, page 51? This is a Response to Interrogatory
7 2.7.119. This is in the material that we provided,
8 page 51, which is page 12 of the document.

9 A. Yes.

10 Q. I am looking here at the table, Load
11 Forecast Error Four Years in Advance.

12 A. Right.

13 Q. Table No. 5.

14 A. Yes.

15 Q. Ontario Hydro. Am I right that it
16 shows that in 1980 the forecast four years in advance
17 was the overforecast by 8.4 per cent and then there was
18 an underforecast in the following years?

19 A. Could you say that again, please?

20 Q. Well, I am just looking at the
21 numbers in the far right-hand column.

22 A. I was reading this and listening and
23 I couldn't do two things at once. Sorry.

24 Q. I just wanted to confirm it shows
25 that the 1980 forecast for four years in advance for

1 '84 overforecast by 8.4 per cent?

2 A. Yes.

3 Q. In the remaining years there was an
4 underforecast?

5 A. Yes.

6 Q. I am just wondering why you don't
7 these numbers as representing the four-year uncertainty
8 in the forecast?

9 A. It is, in effect, these numbers that
10 were used to develop the 8.8 per cent uncertainty that
11 went into the model.

12 What we were looking at on the graph just
13 prior to this, on the table prior to this, was an
14 attempt to take a look at our experience in a few
15 particular recent years.

16 The numbers that you see for Hydro's load
17 forecast there four years in advance are those which
18 are referred to in Exhibit 87 that lead us to the 8.8
19 per cent number for use in the model.

20 Q. What I am getting at, why you have a
21 number of 15 per cent--

22 A. Yes.

23 Q. --for uncertainty in the forecast
24 years?

25 A. Oh, yes. I was reminded that the 15

1 which you are showing there is generation plus load.

2 This is just load.

3 Q. And the generation is the problem you
4 identified with the nuclear units?

5 A. Yes, with whatever units are going
6 into service. If you look at our history, when we are
7 introducing hydraulic, when we are introducing fossil,
8 when we are introducing nuclear, whenever you are
9 introducing something new, there is a likelihood of
10 being late.

11 Q. Mr. Snelson, could I ask you a
12 question again about these CTUs. I am wondering if, in
13 terms of the reserve margin, whether Hydro had looked
14 into the possibility of installing separate units or
15 separate CTUs for those electricity-sensitive
16 industries?

17 I believe Mr. Barrie was saying
18 yesterday, there are some industries which can't go
19 without power; for example, hospitals. And I believe
20 that the gentleman from Dofasco was intimating there
21 are some industries in the industrial sector which are
22 extremely sensitive to being without power.

23 I am just wondering why Hydro doesn't
24 just look into installing separate backup CTUs, either
25 on-site, or island it so that these sensitive public

1 facilities, and perhaps some private ones, would have
2 their own backup system, and then you wouldn't have to
3 over-build the entire system to accommodate the needs
4 of these people?

5 MR. SNELSON: A. Generally speaking, if
6 customers wish, they may add their own backup
7 facilities, and some do.

8 If you are going to add reserve to the
9 system or you are going to add reserve, if Ontario
10 Hydro is going to add reserve, then if all the
11 customers are going to pay for the reserve capacity,
12 why shouldn't all the customers have a right to use it?

13 Q. Have you looked into the relative
14 cost of undertaking that venture? I mean, it may, in
15 fact, be a lot cheaper for a customer point of view to
16 provide those individual backup units than to put on a
17 24 per cent reserve margin on the entire system?

18 A. The cost of providing the 24 per cent
19 reserve margin on the system is very, very small. If
20 you go back to Exhibit 140, and I will take you to
21 figure 2-6 of Exhibit 140--

22 Q. Just a minute.

23 A. --which shows the variation, the
24 bottom line of that figure is the variation in the cost
25 to our customers of electricity as a function of

1 reserve margin, and these are old numbers and they are
2 based upon the coal-fired plant being the marginal
3 plant. With combustion turbines as the marginal plant,
4 the slope of the line will in fact be less.

5 But even with coal-fired plant as the
6 marginal plant, you can see that approximately changing
7 the reserve level by about 5 percentage points changes
8 the overall cost of power by between one and two per
9 cent. And with combustion turbines as the marginal
10 plant, it's more likely to be closer to the one than
11 the two. So, it is economical to provide a high degree
12 of reliability to the whole system which permits a
13 reliable supply to all customers.

14 Q. That's presuming the 24 per cent is
15 all CTUs?

16 A. That is presuming that the difference
17 between, say, 20 per cent and 25 per cent would be
18 provided by CTUs, not the whole of the reserve is CTUs.

19 As we have said, we can't differentiate
20 the capacity between capacity that is base load
21 capacity and capacity that is only reserve capacity.
22 But, we do accept that small variations in reserve
23 margin show up as variations in the combustion turbine
24 component of the plant.

25 Q. And you are still left with the

1 problem of providing a degree of reliability to those
2 sensitive industries and public sector institutions.
3 It doesn't help your problem.

4 What I am getting at is, if a hospital
5 needs power, to have a 24 per cent reserve margin in
6 the entire system doesn't do anything for the hospital.

7 A. Let's go back to the hospital.
8 Hospitals generally have their own energy backup
9 supplies, even with the level of reliability that we
10 provide, and we generally exempt them, as Mr. Barrie
11 has mentioned, from any rotating load cuts.

12 So, in that particular case, we do go
13 considerably to some considerable lengths to manage the
14 system to give them high reliability, and they are also
15 prepared to invest in their own backup facilities to
16 increase that reliability further.

17 Q. Mr. Snelson, I notice in the
18 transcript, Volume 20, page 3515, you were commenting
19 on this question of CTUs, and I believe you said -- I
20 will back up. You said:

21 "If we were to be in the situation
22 where you had increasing frequencies of
23 interruptions up to many, many times what
24 is currently projected, then the effect
25 you describe may take place of increasing

1 damage cost. But there is also the
2 responses of customers who experience
3 unreliable supply and take measures to
4 protect themselves against frequent
5 interruptions. If you have an
6 interruption one day in ten years, you
7 may not decide to buy your own emergency
8 back-up power supply. If you have an
9 interruption one day a week, you may
10 decide to do that and thereby cut your
11 customers' cost of interruptions. But
12 that's not something we recommend. It is
13 just one of the effects that can take
14 place."

15 I am just wondering why you don't
16 recommend it, because it would seem to me that from a
17 system-wide point of view it would decrease the need
18 for a reserve margin.

25 ...

1 MR. SNELSON: A. I believe when you
2 share reserve capacity on a system-wide basis between
3 many users, then it can serve several functions and
4 that is generally more economical than each customer
5 providing his own back-up facilities exclusively for
6 his own use.

7 Q. You say it's also more economical
8 than Hydro providing that back-up for a particular
9 customer's own use?

10 A. If we provide the back-up, then all
11 our customers are going to pay for it and we will
12 generally allow it to be used by all customers if and
13 when they need it.

14 Q. I want to talk briefly about
15 interconnection. I don't know who I should address
16 these questions to, Mr. Taborek or...

17 MR. BARRIE: A. If it's the present
18 interconnection or the historic --

19 THE CHAIRMAN: If you are moving to
20 interconnection, perhaps we could take the afternoon
21 break.

22 MR. STARKMAN: That will be fine.

23 Mr. Rodger, how long are you going to be
24 with these questions, do you think?

25 MR. RODGER: No more than ten or fifteen

1 minutes.

2 THE CHAIRMAN: All right. Well then, we
3 will stop you, Mr. Starkman, about 4:30 then, and if
4 you are not finished, you can finish in the morning,
5 and we will take Mr. Rodger's questions after that.

6 MR. RODGER: Thank you.

7 THE REGISTRAR: This hearing will recess
8 for fifteen minutes.

9 ---Recess at 3:30 p.m.

10 ---On resuming at 3:47 p.m.

11 THE REGISTRAR: This hearing is again in
12 session. Please be seated.

13 THE CHAIRMAN: Mr. Starkman?

14 MR. STARKMAN: Thank you, Mr. Chairman.

15 Q. Just before moving into interconnect,
16 Mr. Taborek, I wanted to ask you if you agree with Mr.
17 Snelson's answer that it wouldn't be fair to have the
18 entire system, if you like, pay for CTUs for individual
19 users because it would be a cross-subsidization?

20 MR. TABOREK: A. I agree with Mr.
21 Snelson's answer, yes.

22 Q. But on the other hand, you don't have
23 a problem with the cross-subsidization inherent in the
24 \$5.91 number?

25 A. I don't agree that cross-

1 subsidization is in the \$5.91 number.

2 Q. What I'm suggesting to you is the
3 that the \$5.91 number is an average number; right?

4 A. Yes.

5 Q. And, therefore, there are people or
6 classes of users which value the cost at much less than
7 \$5.91.

8 A. That's correct.

9 Q. So when you build a reserve margin
10 based on, in part, on a \$5.91 number, doesn't that
11 represent a cross-subsidization from those who gave --
12 who attributed lower cost to a one-hour interruption
13 towards those who attributed a much higher cost? I'm
14 thinking here about the residential, just to make it
15 real simple, as against the large farms or the large
16 industrial users.

17 A. I guess I see it as all customers
18 paying the same for uninterrupted energy -- for
19 interrupted energy.

20 Q. What I'm asking you is, isn't it a
21 cross-subsidization in as much as you are asking those
22 people who had a lower number than \$5.91 to pay for
23 building a system bigger than what would otherwise be
24 necessary in order to provide a reserve margin to those
25 people whose customer interruption costs are, if you

1 like, \$5.91 or greater?

2 A. The question of what constitutes a
3 subsidy and what doesn't I think is a very complex one
4 and I'm not in a position to testify as to whether this
5 is a subsidy or not.

6 Q. All right, that's fine. Can we look
7 at just one other thing while we are on this subject?
8 Can we look at page 29 of Exhibit 136, which is the
9 transparencies you were using. Page 29 is the total
10 cost of electricity chart. And this is again something
11 that, I guess, from our perspective we see as an
12 asymmetry in the way that --

13 THE CHAIRMAN: I'm sorry?

14 MR. STARKMAN: As an asymmetry.

15 THE CHAIRMAN: Thank you.

16 MR. STARKMAN: Q. In the way that
17 Ontario Hydro analyzes the problems. Have you got the
18 one that --

19 MR. TABOREK: A. Yes, it's the schematic
20 view of total customer cost.

21 Q. Yes. I take it that when you
22 determined the cost of customer interruption line, that
23 is the \$5.91?

24 A. Yes.

25 Q. And that in part that counts, in

1 determining that \$5.91 number, that takes into account,
2 if you like, externalities or inconvenience to the
3 customer, that's one of the things that's being
4 accounted for in this line.

5 A. No, I don't believe so.

6 Q. What do you think the \$5.91
7 represents?

8 A. What they would pay.

9 Q. And when someone tells what they
10 would pay, what are they looking at? What factors are
11 they looking at?

12 A. The impact of the cut on them.

13 Q. Yes. And that could include, if you
14 like, loss of production or inconvenience.

15 A. It could include -- it is whatever
16 the impact is on them, yes.

17 Q. On the individuals. And you would
18 acknowledge that would include inconvenience, for
19 example, on a residential basis.

20 A. Yes.

21 Q. All right. But yet, when you do the
22 cost of supply line you don't count any of the
23 externalities or any of the environmental impacts that
24 are associated with the supply.

25 A. I said we did not count externalities

1 on the customer damage side.

2 Q. Well, I'm suggesting to you that when
3 you got the \$5.91 and all those numbers we looked at,
4 that a customer, any customer answering your survey
5 would include what I'm categorizing as externalities
6 when they arrived at their number.

7 A. Well, I think you are reading things
8 into the customer survey that I'm not in a position to
9 do so at this point.

10 MR. SNELSON: A. There are externalities
11 that are not included in our customer surveys.

12 On the industrial and commercial side I
13 believe that it is cleaner in that they were
14 specifically asked, I believe, in the surveys about
15 their costs of lost production and other such
16 out-of-pocket costs.

17 There are second order effects, and I
18 believe in Exhibit 140 it talks about the effect of
19 lost production in industry then causing less wages
20 being paid to workers because they have been laid off
21 for the day who then have less money to spend. All
22 those secondary impacts through the economy are not
23 included in the \$5.91.

24 Other things that are not included in the
25 \$5.91, for instance, are the disruptions that occur to

1 people. There's a whole host of affects on people of
2 electricity outages that would not get captured. For
3 instance, if you go to what is the cost to people who
4 might be trapped in an elevator while there is a power
5 outage. What is the cost to society of a traffic jam
6 that perhaps causes an ambulance being unable to get
7 through to a hospital. There were no questions asked
8 about the aggravation of commuters who, in the event of
9 a power outage, would have a much longer trip home in
10 the evening and what they would pay to avoid that.

11 So, the costs that were surveyed were the
12 direct costs of interruptions. There are secondary
13 effects which can be quite substantial, which are not
14 included in the survey numbers.

15 Q. Mr. Snelson, for the residential
16 customers, what were they answering?

17 A. In the survey that we did, which gave
18 a very low number in the late 1970s, and the one that
19 is not being used at the moment, they were asked about
20 their willingness to pay. I don't know exactly how the
21 question was phrased in the CEA survey that was used in
22 the most current results.

23 Q. Would you agree with me if you asked
24 a customer, a residential customer about their
25 willingness to pay, in part what they're measuring off

1 is the inconvenience factor of being without
2 electricity for a one-hour period of time?

3 A. It's hard to know what customers
4 respond to in a willingness to pay type of question.

5 In the late 1970s there is a suspicion
6 that the numbers that were received were very, very low
7 because customers were angry with Ontario Hydro because
8 they had had a series of high rate increases at that
9 time period and were not prepared in the answer, to any
10 survey to Ontario Hydro, to give any indication they
11 would be prepared to pay any more for their
12 electricity.

13 So, it's hard to speculate as to what
14 customers include and what they don't include. We do
15 know that customers who have frequent outages get very
16 angry with us.

17 Q. Is it your view that they included
18 things like inconvenience or they didn't include them
19 in answering that question?

20 A. I don't know exactly how the question
21 was phrased for the CEA study that has produced the
22 latest 57 cents.

23 Q. Mr. Taborek, when you look at this
24 Page 29, your view is that, what, you haven't counted
25 inconvenience and externalities in the cost of customer

1 interruptions?

2 MR. TABOREK: A. Yes.

3 Q. So am I correct, then, that if you
4 did count externalities in the cost of customer
5 interruptions, then you would end up with much
6 different lines?

7 A. It would give you a higher cost of
8 customer interruptions, yes.

9 Q. If you included externalities in the
10 cost of supply, it would give you a different line?

11 A. What externalities?

12 Q. Environmental impacts, external to
13 Ontario Hydro.

14 A. Well, what kind of environmental
15 impacts, please? I'm not trying to question you or be
16 cute, it is an important clarification I have to know.

17 Q. How would your answer change? I was
18 thinking about damage to the natural environment,
19 social costs, and those types of things.

20 A. Because by and large, those are
21 energy related, they are not capacity related, and
22 hence they are not significant in a reliability
23 calculation.

24 Q. Not significant for reserve margin
25 calculation?

1 A. Yes.

2 Q. To the extent that the reserve margin
3 is made up all of CTUs?

4 A. Well, regardless of what it's made up
5 of, one of the first charts I used in my direct was the
6 depiction of the difference between capacity and
7 energy, and pure capacity has no energy and energy is
8 usually associated with pollutants, waste, et cetera,
9 and so it's not a factor.

10 Q. Thank you. I would like to move onto
11 interconnect.

12 I take it back in the 70s Hydro was
13 making, I assume, no interconnection capacity; am I
14 right about that? I got that out of the Select
15 Committee Report.

16 MR. SNELSON: A. No, I wouldn't say
17 that.

18 Q. Now, I gather from the evidence that
19 Hydro is part of a power pool; is that correct?

20 MR. BARRIE: A. We are not strictly part
21 of a power pool, no. We are part of a reliability
22 council.

23 Q. Yes. And through the various
24 interconnections you are connected to the grid east of
25 the Rocky Mountains.

1 A. That's correct.

2 Q. And the whole discussion of reserve
3 margins, and so forth, is in part about being a good
4 neighbor, so you are not a burden upon the other
5 utilities that you are interconnected with?

6 A. I described in my evidence that part
7 of being interconnected means that we have to abide by
8 certain operating criteria, on planning criteria as
9 well.

10 Q. Am I correct that if a unit goes down
11 nothing -- I mean, there is nothing in particular that
12 needs to be done in the very short term, that the whole
13 system just picks up to accommodate that situation?

14 A. Yes, the instant -- are you talking
15 about a sudden generator trip?

16 Q. Yes.

17 A. The instant that generation is
18 removed from the system, there is a general pick up of
19 all interconnected systems, yes.

20 Q. Now, you have chosen a number of 700
21 megawatts for the interconnect. I don't know if this
22 question is for Mr. Taborek.

23 MR. TABOREK: A. Yes.

24 MR. BARRIE: A. Yes.

25 Q. And from my looking at it, this seems

1 to be somewhat of an arbitrary choice.

2 MR. TABOREK: A. I think arbitrary is
3 too strong. It was arrived at after analysis and
4 judgment.

5 Q. And would it be predominantly
6 judgment that led you to 700?

7 A. No. It is a combination.

8 Q. All right. Now, I note that your
9 interconnect capacity, or the interconnect capability
10 assumed is about 3 per cent of system peak.

11 A. Yes.

12 Q. Can we just look at Exhibit 166, page
13 49. Mr. Taborek, I note in there, the centre column
14 lists the interconnect assistance as per cent of 1989
15 peak, and there is no other utility that assumes less
16 than 5 per cent of interconnect capacity.

17 A. With the exception of the Main pool,
18 yes, 2 to 4 per cent.

19 Q. But all the other ones are above
20 that.

21 A. Well, numbers of 5s and 6s.

22 THE CHAIRMAN: I'm sorry, Mr. Starkman,
23 what is the derivation of this chart?

24
25 ...

1 [4:07 p.m.] MR. STARKMAN: Sorry, Mr. Chairman. It
2 was an answer to Interrogatory 2.7.119, and it was
3 provided by Hydro and it is part of a document called
4 "Survey of Generating Capacity Planning Practices used
5 by Electric Utilities, November 1990."

6 THE CHAIRMAN: So, it's a Hydro document?

7 MR. STARKMAN: Yes.

8 THE CHAIRMAN: Thank you.

9 MR. TABOREK: It is the back-up material
10 which was written up in Exhibit 87, the survey of other
11 utilities. So, it's somewhat more detailed
12 information.

13 THE CHAIRMAN: Thank you.

14 MR. STARKMAN: Q. Now, Mr. Taborek, if
15 Hydro assumed 5 per cent interconnect instead of 3,
16 based on an '89 peak of approximately 23,490 megawatts,
17 my calculations are that you would assume 1,074
18 megawatts of assistance, or approximately 474 megawatts
19 more?

20 MR. TABOREK: A. Yes.

21 Q. And similarly, if you assumed 7 to 11
22 per cent, then you would end up with close to 4,000
23 megawatts of assistance; is that right?

24 A. I will accept your numbers.

25 MR. BARRIE: A. No, those numbers must

1 be wrong.

2 Q. Sorry. It would be 2,500 of
3 assistance.

4 A. That's 11, yes.

5 Q. Now, you are connected to the New
6 York Power Pool?

7 MR. TABOREK: A. They are one of the
8 people we are connected to.

9 Q. I note that - still on this same
10 page, page 49 - New York Power Pool has 11 per cent
11 assumed interconnect assistance.

12 A. Yes.

13 Q. And one of the utilities that they
14 are directly interconnected to is Ontario Hydro; is
15 that correct?

16 A. Yes.

17 Q. Mr. Taborek, some of the utilities
18 that Hydro is connected to on the broader grid are
19 summer peaking; is that correct?

20 MR. SNELSON: A. The utilities to the
21 south of us are about equal, winter and summer peaking.
22 But some of them may be just marginally summer peaking
23 systems, but can have capacity problems in either
24 season.

25 Q. I guess the point I am making here is

1 that if Ontario Hydro is a winter peaking system and
2 you have some summer peaking systems, it's likely they
3 will have more capacity available at the time Ontario
4 Hydro is likely to most need it.

5 A. No, we don't believe that's the case.

6 MR. TABOREK: A. No.

7 MR. SNELSON: A. A utility that has a
8 winter peak that is nearly as high as its summer peak,
9 after it has scheduled maintenance, will probably have
10 as high a risk during the winter as it has during the
11 summer. You have reached this problem on a system that
12 as the summer and winter peaks get closer together,
13 then you can't schedule maintenance and any reliability
14 problems become sort two-pronged problems, they are
15 winter and summer.

16 Q. All right. The 700 megawatts has
17 been the assumption on the interconnect virtually
18 through the 1980s; is that correct?

19 MR. TABOREK: A. Yes.

20 Q. It hasn't change at all?

21 A. That's correct.

22 Q. Can we look at Exhibit 140 which is
23 the 1981 Reliability Criterion Report, and I am looking
24 at page 9, under paragraph 3.2.2, assistance
25 computation.

1 A. Yes.

2 Q. Now, in this area they are talking
3 about the availability of interconnect assistance; is
4 that fair?

5 A. Yes.

6 Q. They are saying that the 1981 -- I am
7 looking at the bottom of the first large paragraph,
8 last sentence: The 1981 transfer capability of these
9 interconnections to Ontario are approximately as
10 follows: Michigan to Ontario, 2000 megawatts; New York
11 to Niagara, 1500; New York to Cornwall, 400; Quebec,
12 1300; Manitoba 200. All right?

13 And then there is a discussion about the
14 difficulties with the transfer from Quebec, and on the
15 next page they say where they got the 700 from--

16 A. Yes.

17 Q. --which is 350 from the U.S., 230
18 from Quebec and 120 from Manitoba.

19 I had a number of questions and they are
20 mostly along the lines of why hasn't the interconnect
21 assumption, the 700 megawatts, been increased in the
22 last decade? That's from 1980 through to '90.

23 First of all, I guess with the evidence
24 that we had about the updating of the proposed
25 transmission line from Manitoba, this would allow for

1 greater interconnect from Manitoba; am I correct in
2 that?

3 MR. SNELSON: A. The amount by which
4 emergency assistance can be obtained from Manitoba
5 would be the difference between the capacity of the
6 transmission system and the amount that was in the firm
7 purchase. The Manitoba to Ontario transfer limit is
8 shown here as 200 megawatts. Mr. Barrie has an
9 indication that the current number is about 300
10 megawatts.

11 The provision of the purchase and the tie
12 line could increase that to 500 megawatts, but that
13 might be reduced if there is additional non-utility
14 generation in the west system that uses up part of the
15 capacity of the tie lines, or other generation such as
16 Little Jackfish.

17 So, it will depend upon the load and
18 capacity balance in the west system as well as the
19 actual physical capability to transfer load across the
20 Manitoba/Ontario border.

21 Q. I appreciate that, but I think my
22 question is, and maybe just more straightforward, if
23 you are building a brand new 1500 megawatt line,
24 wouldn't you think that there would be greater
25 interconnect assistance available from Manitoba than

1 there was in 1980, when you didn't have that line?

2 A. It depends on how much of that
3 capability is used up by other functions of the
4 transmission line.

5 Q. But you would expect there would be
6 some greater interconnect assistance available?

7 A. It's probable there would be some
8 interconnect.

9 Q. Now, the other transfer point, or
10 another transfer point is Michigan to Ontario.

11 MR. BARRIE: A. Yes.

12 Q. I understand that there is proposed a
13 line running from London west.

14 A. Yes.

15 Q. All right. And what size line is
16 that?

17 A. I am not sure what the capacity of
18 the line is, but it doesn't affect the actual transfer
19 capability at the Michigan interface. This is a
20 reinforcement internally of Ontario Hydro's
21 transmission system.

22 Q. So, it won't provide any additional
23 transmission capability?

24 A. The transmission capability between
25 Michigan and Ontario Hydro is around 2000 megawatts.

1 Q. I don't know if, Mr. Taborek...

2 Mr. Barrie, can we look at page 128?

3 Hold that page of Exhibit 140 and look at --

4 THE CHAIRMAN: 128 of 140?

5 MR. STARKMAN: Of 166, yes.

6 THE CHAIRMAN: Sorry.

7 MR. STARKMAN: Maybe I should have gone a
8 little more slowly.

9 I am asking him to hold page 9 of Exhibit
10 140, which is the one that we were looking at with
11 respect to the interconnect, and to turn to page 127 of
12 Exhibit 166.

13 THE CHAIRMAN: That's the one with the
14 map on it?

15 MR. STARKMAN: Yes.

16 Q. Just by way of explication perhaps,
17 it just says Northeast Power Coordinating Council and
18 it has a map, and I take can it Ontario is part of the
19 Northeast Power Coordinating Council.

20 MR. BARRIE: A. Yes, we are part of the
21 NFCC.

22 Q. On the next page, the Coordinating
23 Council seems to indicate the first contingency
24 incremental transfer capabilities that are available,
25 and the one that I was particularly interested in

1 looking at was the New York/Ontario Hydro transfer
2 numbers.

3 A. Yes.

4 Q. I guess, what strikes me is that the
5 capability, according to this graph, has greatly
6 increased or has increased over what it was in 1980.
7 Am I correct in that?

8 A. I don't know what it was in 1980.

9 Q. That's why I said, could you please
10 hold page 9 of Exhibit 140.

11 A. Yes, this would be equivalent to the
12 sum of the Niagara and Cornwall.

13 Q. Yes?

14 A. Which would be 1900.

15 Q. Yes, it was 1900 in 1980?

16 A. Yes.

17 Q. And am I right now it seems to be
18 2825?

19 A. One has to treat this number with
20 great care.

21 Immediately underneath this table you see
22 a note that's very important, these figures are via all
23 paths. That's very important. So, the interchange
24 with New York, this figure gives 2825, is via the
25 direct ties which are to New York. And, as I mentioned

1 in previous testimony, some flow will go through
2 Michigan and to New York, if we are making either big
3 imports or big purchases.

4 So, we have an agreed limit with New York
5 on the direct tie lines of 2000 megawatts. This is a
6 jointly agreed limit that we arrived at with New York
7 as a result of extensive stability studies that we have
8 done.

9 So, if you want to have a number that's
10 equivalent to this, you should use 2000 megawatts. We
11 will not import or export more than 2000 megawatts on
12 the tie lines between Ontario Hydro and New York.

13 Q. You have an agreement with them that
14 you will not do more than 2000?

15 A. In either direction.

16 Q. All right. In 1980 the assumption
17 was 350 megawatts for all of the U.S., I am just
18 looking on page 10 of Exhibit 140, 350 which includes
19 Michigan and New York.

20 A. I think we have to make a very clear
21 distinction here. What I am talking about here are
22 transmission limitations, it has nothing to do with how
23 much resources are available. So my 2,000 assumes that
24 they have 2,000 that they want to sell to us or we have
25 2,000 that we want to sell to them. I believe the 700

1 megawatts - and my planning colleagues can talk to it
2 better than I can - is based on the availability of
3 resources, of generation resources. It has nothing to
4 do with transmission limits.

5 THE CHAIRMAN: Before we leave that. Is
6 the 2,000 from New York in addition to or included in
7 the 2,000 in Michigan you mentioned a few minutes ago?

8 MR. BARRIE: It would be in addition to,
9 but I would like to just add one caveat.

10 If we are in a position where we are
11 either exporting or importing massive amounts of power
12 like that, we would run into internal system
13 limitations before we exceeded either of those two
14 limits.

15 In fact, if we look back at the kinds of
16 operation we have had in the past, when we were trying
17 to import a lot of power over those two interfaces,
18 both of which were 2,000, we ran up against internal
19 limits at about 3,200.

20 THE CHAIRMAN: In the aggregate?

21 MR. BARRIE: Yes. So, they are not...

22 THE CHAIRMAN: That is 3,200 from both
23 sources combined?

24 MR. BARRIE: That's correct. And that is
25 the most we have ever been able to import, by the way.

1 There have been other instances where we
2 have tried to import large amounts of power and our
3 internal limitations have prevented us long before we
4 reached 3,200. We had an example where we couldn't
5 import anymore than 1,500 on one particular occasion
6 because of internal limits within our system.

7 THE CHAIRMAN: When do you power becomes
8 massive? You said massive amounts, 2,000 was massive.
9 What is massive?

10 MR. BARRIE: Well, when we were importing
11 3,000 we certainly regarded that as a massive import.
12 We don't normally go in for that degree of power
13 imports.

14 During 1989 and 1990 there were periods
15 where we would be importing up to 1,500 and that became
16 relatively normal during those two years.

17 But certainly a number like 3,000 would
18 be very unusual.

19 MR. STARKMAN: Q. Mr. Barrie, just a
20 couple of follow up questions on that. And before I
21 get to that, maybe I should indicate that what you have
22 told us, I am looking here at page 14 of Exhibit 166,
23 which discusses the various numbers about the amount of
24 power that you have been able to purchase, and so
25 forth. I would ask you just to look at that and tell

1 me if that summarizes what it is you have just...

2 MR. BARRIE: A. This is the Response to
3 Interrogatory 2.77?

4 Q. Yes.

5 A. Yes, in here I mention the 3,200 as
6 being the maximum from New York to Michigan. 300 from
7 Manitoba. We can get some from Minnesota, as well, a
8 very small amount, 150. Hydro Quebec is a separate
9 kind of system where they have to split off machines to
10 us. About half of this 1400 would be delivered to us
11 at Beauharnois.

12 Yes, I think what I have said is broadly
13 in agreement with this.

14 Q. Okay. Let me ask you, what I get
15 from what you have said then in terms of the
16 limitations on the interconnect it is a transmission
17 problem. You said it wasn't necessarily the
18 availability of generation but it was the transmission
19 limitation.

20 A. Those limitations I have described to
21 you are transmission limitations.

22 Q. So, if the transmission was
23 increased, or improved, holding everything else equal,
24 you would be able to get more interconnect assistance;
25 is that fair?

1 A. If the transmission is reinforced
2 then the transmission limitations will be eased. You
3 would have to reinforce both at the tie lines and those
4 internal limitations as well. This always assumes that
5 there is a generation available.

6 I am only talking the ability of the
7 transmission to move the power.

8 Q. Yes.

9 A. Yes.

10 Q. But it was my understanding that the
11 line from London west was intended to ease some of the
12 internal transmission problems and make interconnect
13 assistance more available.

14 A. That's correct. That particular
15 reinforcement will assist in our transfers, in some of
16 those internal limitations I mentioned between Michigan
17 and ourselves.

18 Q. And am I correct that the New York
19 Power Pool has indicated, I believe -- is relying on
20 Ontario Hydro for 11 per cent interconnect assistance?

21 MR. TABOREK: A. No, they are not
22 relying on Ontario Hydro. They are relying on all of
23 the utilities around them, including Ontario Hydro for
24 that.

25 Q. Okay. So, the members of the New

1 York Power Pool are relying on all the members of the
2 Power Pool which including -- and Ontario Hydro for 11
3 per cent interconnect assistance?

4 MR. BARRIE: A. No. The New York Power
5 Pool, as a pool, are relying on all of those people who
6 are interconnected with them. So, it's not other
7 members of the pool. We are talking about another
8 pool. PJM, Pennsylvannia, New Jersey, Maryland, New
9 England, Ontario Hydro and Hydro Quebec all have
10 interconnections with New York Power Pool.

11 Q. And so they are relying on, all those
12 people with interconnections, for 11 per cent of
13 interconnect assistance?

14 A. Correct.

15 Q. Why is Ontario Hydro then only
16 relying on those same people for 3 per cent
17 interconnect assistance?

18 MR. TABOREK: A. For two reasons, that
19 we are not interconnected to the same number of people
20 and the same types of people that the New York Power
21 Pool is, and we are taking into account in our
22 predictions of what will be available to you, load
23 forecast error correlation; namely, that when we are
24 forecasting load forecasts that are giving us problems,
25 then they are having similar problems.

1 Q. Yes. And, Mr. Taborek, on that
2 point, has Hydro done -- I believe you told us before
3 you were taking into account load forecast and also the
4 simultaneity of problems in these other jurisdictions.

5 A. Yes.

6 Q. But has Hydro done any study to see
7 whether or not there is simultaneity of problems or
8 simultaneity of load forecast error that you keep
9 referring to?

10 A. Yes. It is referred to in Exhibit
11 140, and you can similarly see the effect in Exhibit
12 87. We were, earlier, looking at the load forecast
13 errors of Ontario Hydro and various utilities, and if
14 the signs are the same on the errors, roughly speaking,
15 they would be correlated.

16 Q. And in the past decade has Hydro had
17 any difficulty getting interconnect assistance when
18 they needed it?

19 MR. BARRIE: A. In general, assistance
20 has been available when we wanted it. There has been
21 the odd occasion when we were unable to get the
22 assistance when we requested it.

23 I do believe in my direct evidence I
24 cited one example where we wanted more assistance and
25 were unable to get it.

MR. TABOREK: A. We did note also that that the period of the early 80s was the period in which the North American utilities were coming out of a surplus situation, and we and other utilities had good reserve margins available. That is, in effect, the correlation the other way, that we were all over -- we all had a surplus.

• • •

1 Q. But the systems that Hydro is
2 interconnected to, is it fair to say they are all
3 bigger now, meaning in 1991 or 1990, than they were in
4 1980 or 1981?

5 A. Yes. They would all by and large be
6 bigger, but that doesn't necessarily mean that the
7 amount of reserve they have available is more. To do
8 that you would have to look at whether their capacity
9 has kept up with their growth, whether they have been
10 building, and then you would have to think if there are
11 other factors that have happened that would affect
12 their capacity, and in that respect the environmental,
13 the Clean Air Act amendments that we mentioned earlier,
14 may well have an effect on U.S. capacity causing
15 retirements of older plants.

16 Q. But what I'm suggesting to you is
17 this: You have got a proposed interconnect, better
18 interconnect with Manitoba, you have got better
19 internal lines from London west, you have got a bigger
20 system in New York, according to Mr. Barrie, at least a
21 hundred megawatts more, if that's the right
22 calculation. It seems to me --

23 MR. BARRIE: A. Sorry, what was that
24 reference?

25 Q. You said it was 2,000 available.

1 A. Yes.

2 Q. As opposed to 1,900. You have got
3 all of these things suggesting that more
4 interconnect -- that an assumption of more than 700
5 megawatts interconnect would be available, yet you
6 maintain the same number that you struck in 1980 or
7 '81.

8 MR. TABOREK: A. Yes, Mr. Starkman, we
9 reviewed all of those factors, and in our judgment the
10 700 is still an appropriate number.

11 MR. STARKMAN: Thank you, Mr. Taborek.

12 Mr. Chairman, I know it's about 4:30, and
13 I was going to move on.

14 THE CHAIRMAN: Perhaps then we will take
15 Mr. Rodger now, if you don't mind, Mr. Starkman, I
16 would appreciate that.

17 Mr. Rodger, I hope you will be able to do
18 it in fifteen minutes.

19 MR. RODGER: I will.

20 THE CHAIRMAN: Should we have the answers
21 to the interrogatories?

22 MR. RODGER: Yes, I have provided them
23 already to Mr. Lucas. And thanks to my friend for
24 allowing me to get these questions in today.

25 I have put additional copies at the back

1 of the hearing room for anybody else who would like a
2 copy of it.

3 FURTHER CROSS-EXAMINATION BY MR. RODGER:

4 Q. Panel, the first undertaking which I
5 would like to ask a question of clarification.

6 Actually, all three of the responses which you kindly
7 gave me are more or less questions of clarification.

8 You will recall last week that I was
9 asking you about a survey done in California regarding
10 bad years and there was various statistics pertaining
11 to that survey. And I asked you about how a bad year
12 was defined in that California survey, and the answer
13 you provided to me in Exhibit 142.44 was that:

14 "The definition of a bad year was left
15 to the discretion of the individual
16 utilities which took part in the survey.
17 Each reported what it regarded as a bad
18 year."

19 And my question is, could you give me
20 some kind of an indication of what the range is that
21 were given by different utilities as to what they
22 thought a bad year was? And by that I mean, since
23 everybody was working from a different definition could
24 the range be -- if we can bring it all down to system
25 minutes for example, could one utility's bad year have

1 been ten minutes and another year's been a hundred
2 minutes?

3 MR. TABOREK: A. No. What it was, they
4 did not approach it on that basis of define a criteria.

5 What they did was they asked the utility
6 what they felt subjectively was a bad year, and then
7 what they did was look at that and use that as an
8 indication, attempt to translate that into a system
9 minute criteria. No, they used a percentage type of
10 criteria.

11 So it was a very ill-defined thing. It
12 was, what is your judgment? They picked a year, this
13 was a year I wouldn't want to do again, and then they
14 examined that year.

15 It left us a bit dissatisfied, it was a
16 very fuzzy thing. That's why when we did our
17 experience review, we picked five years, we didn't
18 label them, we just looked at what happened, and we did
19 it a little bit different than this.

20 Q. I see. So each of the various
21 utilities that were surveyed, they had their own
22 definition of what a bad year was, but that was somehow
23 funneled in --

24 A. Yes. It was the year that gave them
25 difficulty.

1 Q. Okay. And just so I'm clear, would
2 it be fair to say that Hydro's definition of bad year
3 currently, that would be any year where the standard of
4 25 system minutes of unsupplied energy is exceeded?

5 A. Well, we have actually used -- Mr.
6 Barrie and I were discussing who gets this question
7 because Mr. Barrie has used bad year and I have used
8 bad year. We probably, when I think of it, used it in
9 about three ways.

10 Mr. Barrie described some difficult
11 operating situations. In Exhibit 140 we used bad year
12 to describe a particular calculation we did of a more
13 extreme case.

14 I don't think we actually have a
15 definition of a bad year per se. It's a general
16 nomenclature that we use.

17 Q. So let's say, I will give you a
18 hypothetical, the California survey did another survey
19 today and had asked in that survey -- Hydro was one of
20 the participants, and that term came up again, bad
21 year, how would Hydro interpret that in terms of our
22 discussion of the unsupplied energy?

23 A. What I would do is I would send them
24 the chapter in Exhibit 87 which dealt with the review
25 of our experience because this is what they are trying

1 to do, experience factor to fit against a model, and I
2 would say I would decline to pick a bad year. I would
3 tell them to look at Exhibit 87, I think it's Chapter
4 6. I think there is a bunch of figures where there are
5 chronological plots of our reserve margin, and tell
6 them that whenever we had reserve margins of less than
7 such-and-such it would be difficult for us. Because
8 what we saw is that really we were very close lots of
9 times through all of those years.

10 So I wouldn't respond, if I had a choice,
11 to a bad year question like that.

12 MR. BARRIE: A. Could I indicate...

13 Q. Sure.

14 A. From a pure operating perspective, a
15 bad year is when we have to use emergency measures to a
16 considerable extent.

17 I indicated in my evidence about the
18 stress indicators, I think I called them, things like
19 use of voltage reductions, use of customer appeals.
20 What we are trying to do is give some indicators before
21 we actually get the load shedding, rotating load cuts,
22 which are the ultimate bad year. But short of actually
23 doing that, we want to give some indications that we
24 are in a stressful situation, we use things like
25 voltage reductions, customer appeals, that kind of

1 thing. So that's how I would describe it.

2 But what I would tend to capture, by the
3 way, is all forms of operating problems, both
4 transmission and generation, which tends to complicate
5 matters if you are looking at a bad year from a
6 generation planning perspective.

7 Q. And for example, that California
8 survey, that included transmission problems, as I
9 understand it?

10 A. It did. Transmission constraints
11 were part of that, yes.

12 MR. TABOREK: A. And Figure 6-1 I
13 referred to are an indication of the degree to which
14 you would require use of emergency measures, so it fits
15 with Mr. Barrie's description.

16 Q. All right. The next undertaking
17 142.47 is with respect to the Saskatchewan survey, and
18 there is actually two questions arising out of that
19 undertaking. The first, you will recall I asked
20 whether this Saskatchewan survey canvassed entities
21 other than the farms and residences which Hydro later
22 incorporated into its surveys, and the second question
23 was with respect to where the farms and residences were
24 located. Were they located just in Saskatchewan or
25 Ontario, or across the country, or what were the

1 particulars of that?

2 The response I got, the short answer is
3 no, and that answer pertains to what entities were
4 covered, were surveyed, and I understand that they
5 include commercial, and small industrial properties
6 were also included in that Saskatchewan survey.

7 Now, Hydro didn't use the data from those
8 two groups, from the commercial and the small
9 industries, in your Exhibit 87, and that was in Table
10 4.8 on page 82. I was wondering if you could tell me
11 why you didn't include the results from the commercial
12 and small industries?

13 A. I think we were perturbed about the
14 farm and residential numbers, and the Saskatchewan
15 numbers we thought were more realistic. And I would
16 presume that with commercial and industrial, the
17 Saskatchewan survey tended to corroborate our numbers.

18 Q. When you say that Hydro's numbers
19 were more realistic, were the Saskatchewan numbers too
20 high, too low, was there a particular --

21 A. With the farms and residences?

22 THE CHAIRMAN: No, no, he's talking about
23 commercial and small industrial.

24 MR. TABOREK: I will check. I think they
25 probably corroborated our numbers and so we didn't feel

1 the need to change.

2 So for one hour, the Hydro numbers were
3 in the range of \$10 to \$20 dollars, and the
4 Saskatchewan numbers, they were in the range of \$3 to
5 \$12, so they were lower.

6 MR. RODGER: Q. They were quite a bit
7 lower than Hydro's numbers?

8 MR. TABOREK: A. So they were lower.

9 Q. So they were lower. Now, the second
10 part of the undertaking was where the farms and
11 residences were located in the Saskatchewan survey.
12 The answer we got back was that it covered all of
13 Ontario.

14 THE CHAIRMAN: Canada.

15 MR. RODGER: I'm sorry, covered all of
16 Canada.

17 Q. And so I take it from that that the
18 farms and residences, it was a weighted average, there
19 was some farms and residences from BC, from Prince
20 Edward Island, from Ontario, perhaps from the Northwest
21 Territories, and they came up with a weighted average
22 based on that survey from across the country? Would I
23 be correct in that understanding?

24 MR. TABOREK: A. I don't know the answer
25 to that. No, I don't know the answer to that.

1 Q. I hate to ask a further undertaking.

2 The point I'm trying to get at, and
3 particularly given your answer on the commercial and
4 small industries, I want to try and get a basis from
5 how you made that jump from your 1980 cost for farms
6 particularly, you recall it was in the range of
7 \$275.00.

8 A. Yes.

9 Q. And you remember last week that I
10 factored it up giving your other numbers in the 1990
11 survey, to come up with a figure for farms of about
12 four hundred and some odd dollars, and that was reduced
13 to about 75 cents, that's what I'm trying to determine.

14 A. Yes. We will take an undertaking.

15 MRS. FORMUSA: Could we get clear on what
16 exactly the undertaking is, for the record?

17 MS. PATTERSON: Was there a weighted
18 average?

19 MR. RODGER: Yes, was there a weighted
20 average from the data which covered the farms and
21 residences.

22 THE CHAIRMAN: I guess the point is, if
23 you are using Canadian figures for farms and whatever -
24 I forget what the second one was - farms and something
25 else, how does that apply to necessarily - or does it -

1 to the Province of Ontario?

2 MR. RODGER: I guess that's my point.

3 Q. In 1980 I understand you used figures,
4 survey figures looking at Ontario farms only, and if
5 that's the best source of data, how is a weighted
6 average going to -- how is that better data in terms of
7 the customer damage?

8 That's it in a nutshell.

9 MR. SNELSON: A. Maybe I can answer that
10 for you, and that is as we have discussed, I think when
11 we were first discussing this with you, we explained
12 that we felt that the Ontario survey data for
13 residences was unreasonably low and that the Ontario
14 survey data for large farms was unreasonably high.

15 At the time that we did the report in
16 1981 it was the only data that we had available, but we
17 used it cautiously and we looked for an answer for our
18 reliability studies that really wasn't sensitive to
19 whether those numbers were too high or too low.

20 We looked at the effect with and without
21 the large farm numbers which could significantly strain
22 your results, and came to the conclusion it was
23 reasonably independent of that.

24 But the fact was that we were not
25 satisfied with the Ontario data and, therefore, when

1 there was some Canadian data that was obtained, our
2 judgment was that that was better than the Ontario data
3 which we had never been really satisfied with from the
4 start.

...

1 [4:45 p.m.] Q. All right. The last undertaking was
2 142.45, and this undertaking stemmed from a discussion
3 of CTUs and the 3-, 4-year lead time which Hydro is
4 estimating. And I was asking questions, or during the
5 course of my questions we heard from Mrs. Formusa that
6 there were certain exemption orders in place, and I
7 just want to see if I understand this exemption order
8 correctly.

9 The first page of the response to the
10 undertaking shows exemption order OH-13/3, and this
11 exemption order applies to combustion turbine
12 facilities at existing sites, and that's in paragraph A
13 of the exemption order. And if we look to the other
14 column on that page, the right-hand column,
15 three-quarters of the way down, it states: "This
16 exemption is subject to the following terms and
17 conditions," and the second condition is:

18 "Where any activity which otherwise
19 would be exempt under this order is being
20 carried as, or is part of an undertaking
21 for which an environmental assesment has
22 been accepted, approval to proceed
23 received, the activity shall be carried
24 in accordance with any terms or
25 conditions in the approval to proceed."

1 Now, do I understand it correctly, first
2 of all, that that condition doesn't apply to CTUs that
3 may be contemplated but which are not part of the plan
4 since this undertaking hasn't been accepted or approved
5 yet, and that's what we are in the process in. So,
6 does this exception order apply to any CTU which Hydro
7 may wish to put in place at existing sites from now
8 until 1994 when the exemption order expires? Is my
9 understanding correct with that?

10 MR. SNELSON: A. I am not sure that any
11 of us is expert in interpreting these regulations and
12 exemptions.

13 Q. I understand this to say that if
14 Hydro decides tomorrow that it needs a CTU, it won't
15 need any environmental assessment as long as that CTU
16 is constructed at an existing site, but after 1994 when
17 this exemption order expires, either Hydro's has got to
18 apply for another exemption or else it has to go
19 through the environmental assessment process, and
20 that's the point I just want clarification on.

21 MRS. FORMUSA: Perhaps I should just
22 speak to that.

23 I think Mr. Rodger's assessment of the
24 regulation is a fair one with respect to combustion
25 turbine units - and I stress, it's at existing sites

1 only - in the two situations that are posited,
2 emergency and/or predicted shortage of generating
3 capacity. And the exemption order does expire in five
4 years from the date of the proclamation. So, unless
5 this was renewed, there would be nothing to cover the
6 situation post 1994 except for other approvals under
7 the Environmental Assessment Act.

8 MR. RODGERS: Those are all my points of
9 clarification, Mr. Chairman.

10 THE CHAIRMAN: Thank you, Mr. Rodgers,
11 we will adjourn now until tomorrow morning at ten
12 o'clock.

13 MRS. FORMUSA: Mr. Chairman, I wonder if
14 I might just ask about re-examination, my examination
15 of the panel. I wasn't quite sure, does the Board
16 propose to ask questions before? I am not sure of the
17 order.

18 THE CHAIRMAN: Well, I am not sure
19 either, but we did it last time, at Mr. Campbell's
20 request, that any questions we asked, we asked, I
21 think, after the intervenors had asked their questions
22 but before Mr. Campbell asked his.

23 MRS. FORMUSA: What I am really driving
24 at is the timing of when I might be expected to do it.
25 It looks remote for tomorrow, but it would certainly be

1 helpful to know if it was entirely out of the question.

2 THE CHAIRMAN: I don't think the panel is
3 going to take very long asking questions, put it that
4 way.

5 MRS. FORMUSA: So, I should use that in
6 my assessment of how long everyone else will take.

7 THE CHAIRMAN: Yes. How long everyone
8 else will take, I have no idea.

9 MRS. FORMUSA: Thank you.

10 THE REGISTRAR: This hearing will adjourn
11 until ten o'clock tomorrow morning.

12 ---Whereupon the hearing was adjourned at 4:50 p.m. to
13 be resumed on Wednesday, June 5, 1991, at 10:00 a.m.

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